

# Napa Valley Transportation Authority

625 Burnell Street  
Napa, CA 94559



## Agenda - Final

Wednesday, November 20, 2024  
1:00 PM

JoAnn Busenbark Board Room

### NVTA Board of Directors and (County of Napa Board of Supervisors\*)

\*This meeting is also being noticed as a Board of Supervisors' meeting due to having 2 current Board Members (Supervisors Pedroza and Gregory) and 1 Supervisor-Elect (Councilmember Alessio) in attendance.

All materials relating to an agenda item for an open session of a regular meeting of the NVTA Board of Directors are posted on the NVTA website at: <https://nctpa.legistar.com/Calendar.aspx>

This meeting will be conducted as an in-person meeting at the location noted above. Remote teleconference access is provided for the public's convenience and in the event a Board Member requests remote participation due to just cause or emergency circumstances pursuant to Government Code section 54953(f). Please be advised that if a Board Member is not participating in the meeting remotely, remote participation for members of the public is provided for convenience only and in the event that the Zoom teleconference connection malfunctions for any reason, the Board of Directors reserves the right to conduct the meeting without remote access and take action on any agenda item.

The public may participate telephonically or electronically via the methods below:

1) To join the meeting via Zoom video conference from your PC, Mac, iPad, iPhone or Android: go to <https://zoom.us/join> and enter meeting ID 864 1754 4351

2) To join the Zoom meeting by phone: dial 1-669-900-6833, enter meeting ID: 864 1754 4351 If asked for the participant ID or code, press #.

3) Watch live on YouTube: <https://www.youtube.com/channel/UCrjLcW9uRmA0EE6w-eKZyw?app=desktop>

The agenda will be posted 72 hours prior to the meeting and will be available for public inspection, on and after at the time of such distribution, in the office of the Secretary of the NVTA Board of Directors, 625 Burnell Street, Napa, California 94559, Monday through Friday, between the hours of 8:00 a.m. and 4:30 p.m., except for NVTA holidays. Should the office be closed or staff is working remotely due to a declared emergency, you may email [info@nvta.ca.gov](mailto:info@nvta.ca.gov) to request a copy of the agenda.

Public records related to an agenda item that are distributed less than 72 hours before this meeting are

available for public inspection during normal business hours at the NVTA office at 625 Burnell Street, Napa, CA 94559 and will be made available to the public on the NVTA website at [nvta.ca.gov](http://nvta.ca.gov). Availability of materials related to agenda items for public inspection does not include materials which are exempt from public disclosure under Government Code sections 6253.5, 6254, 6254.3, 6254.7, 6254.15, 6254.16, or 6254.22.

Members of the public may comment on matters within the subject matter of the Board's jurisdiction, that are not on the meeting agenda during the general Public Comment item at the beginning of the meeting. Comments related to a specific item on the agenda must be reserved until the time the agenda item is considered and the Chair invites public comment. While members of the public are welcome to address the Board, under the Brown Act, Board members may not deliberate or take action on items not on the agenda, and generally may only listen.

Members of the public may submit a public comment in writing by emailing [info@nvta.ca.gov](mailto:info@nvta.ca.gov) by 10:00 a.m. on the day of the meeting with PUBLIC COMMENT as the subject line (for comments related to an agenda item, please include the item number). All written comments should be 350 words or less, which corresponds to approximately 3 minutes or less of speaking time. Public comments emailed to [info@nvta.ca.gov](mailto:info@nvta.ca.gov) after 10 a.m. the day of the meeting will be entered into the record but not read out loud. If authors of the written correspondence would like to speak, they are free to do so and should raise their hand and the Chair will call upon them at the appropriate time.

1. To comment while attending via Zoom, click the "Raise Your Hand" button (click on the "Participants" tab) to request to speak when Public Comment is being taken on the Agenda item. You must unmute yourself when it is your turn to make your comment for up to 3 minutes. After the allotted time, you will then be re-muted. Instructions for how to "Raise Your Hand" are available at <https://support.zoom.us/hc/en-us/articles/205566129-Raise-Hand-In-Webinar>.

2. To comment by phone, press "\*9" to request to speak when Public Comment is being taken on the Agenda item. You must unmute yourself by pressing "\*6" when it is your turn to make your comment, for up to 3 minutes. After the allotted time, you will be re-muted.

The methods of observing, listening, or providing public comment to the meeting may be altered due to technical difficulties or the meeting may be cancelled, if needed.

Note: Where times are indicated for agenda items, they are approximate and intended as estimates only, and may be shorter or longer as needed.

Information on obtaining the agenda in an alternate format is noted below:

Americans with Disabilities Act (ADA): This Agenda shall be made available upon request in alternate formats to persons with a disability. Persons requesting a disability-related modification or accommodation should contact Laura Sanderlin, NVTA Board Secretary, at (707) 259-8633 during regular business hours, at least 48 hours prior to the time of the meeting.

Acceso y el Titulo VI: La NVTA puede proveer asistencia/facilitar la comunicaci3n a las personas discapacitadas y los individuos con conocimiento limitado del ingl3s quienes quieran dirigirse a la Autoridad. Para solicitar asistencia, por favor llame al n3mero (707) 259-8633. Requerimos que solicite asistencia con tres d3as h3biles de anticipaci3n para poderle proveer asistencia.

Ang Accessibility at Title VI: Ang NVTA ay nagkakaloob ng mga serbisyo/akomodasyon kung hilingin ang mga ito, ng mga taong may kapansanan at mga indibiduwal na may limitadong kaalaman sa wikang Ingles, na nais na matugunan ang mga bagay-bagay na may kinalaman sa NVTA-TA Board. Para sa mga tulong sa akomodasyon o pagsasalin-wika, mangyari lang tumawag sa (707) 259-8633. Kakailanganin namin ng paunang abiso na tatlong araw na may pasok sa trabaho para matugunan ang inyong kahilingan.

1. Call to Order
2. Approval of Board Member Remote Participation
3. Roll Call
4. Adoption of the Agenda
5. Public Comment
6. Chairperson's, Board Members', Metropolitan Transportation Commissioner's, and Association of Bay Area Governments Update
7. Executive Director's Update
8. Caltrans' Update

Note: Where times are indicated for the agenda items, they are approximate and intended as estimates only and may be shorter or longer as needed.

## **9. PRESENTATIONS**

### **9.1 Board Member Service Recognition (Kate Miller)**

*Estimated Time:* 1:35 p.m.

### **9.2 Accessible Transportation Needs Assessment (ATNA) Study (Diana Meehan)**

*Estimated Time:* 2:00 p.m.

## **10. CONSENT AGENDA ITEMS**

**10.1 Resolution No. 24-17 Amending the Bylaws of the Napa Valley Transportation Authority (NVTA) (Laura Sanderlin) (Pages 10-27)**

**Recommendation:** That the Napa Valley Transportation Authority (NVTA) approve Resolution No. 24-17 amending the bylaws of the governing body.

**Estimated Time:** 2:05 p.m.

**Attachments:** [Staff Report](#)

**10.2 Resolution No. 24-15 Setting the Regular Meeting Time, Place, and Schedule of the Napa Valley Transportation Authority (NVTA) Governing Board for Calendar Year (CY) 2025 (Laura Sanderlin) (Pages 28-32)**

**Recommendation:** That the Napa Valley Transportation Authority (NVTA) Board approve Resolution No. 24-15 setting the regular meeting time, place, and schedule of the NVTA Governing Board for Calendar Year (CY) 2025.

**Estimated Time:** 2:05 p.m.

**Attachments:** [Staff Report](#)

**10.3 Resolution No. 24-16 Amending Napa Valley Transportation Authority (NVTA) Conflict of Interest Code (Laura Sanderlin) (Pages 33-39)**

**Recommendation:** That the Napa Valley Transportation Authority (NVTA) approve Resolution No. 24-16 amending the Conflict of Interest Code and direct the Secretary to forward it to the Napa County Board of Supervisors as the reviewing authority in Napa County.

**Estimated Time:** 2:05 p.m.

**Attachments:** [Staff Report](#)

**10.4 Contract Amendment with Kleinfelder for Construction Services (Grant Bailey) (Pages 50-56)**

**Recommendation:** That the Napa Valley Transportation Authority (NVTA) Board authorize the Executive Director to execute and make minor modifications to Amendment #3 to Agreement 21-20-CM01 for construction management and material testing services with Kleinfelder Construction Services, increasing the contract value by \$46,276 for an amount not to exceed \$1,945,102.

**Estimated Time:** 2:05 p.m.

**Attachments:** [Staff Report](#)

**10.5 Meeting Minutes of October 16, 2024 (Laura Sanderlin) (Pages 57-61)**

**Recommendation:** Board action will approve the minutes of the October 16th regular meeting.

**Estimated Time:** 2:05 p.m.

**Attachments:** [Draft Minutes](#)

**11. REGULAR AGENDA ITEMS**

**11.1 Construction Contract Award for the Soscol Gateway Transit Center Tenant Improvements Project (Grant Bailey) (Pages 62-342)**

**Recommendation:** That the Napa Valley Transportation Authority (NVTA) Board

1. Award Construction Contract No. 24-C40 to Carr's Construction Service, Inc. of Santa Rosa, CA in an amount not to exceed \$724,000;
2. Authorize the Executive Director to enter into and make minor modifications to Construction Agreement No. 24-C40 with Carr's Construction Service, Inc. for the construction phase of the Soscol Gateway Transit Center Tenant Improvements project (Project); and
3. Approve a fifteen percent (15%) construction contingency in an amount not to exceed \$108,600 for change orders.

**Estimated Time:** 2:10 p.m.

**Attachments:** [Staff Report](#)

**11.2 Consultant Support Contract for the Soscol Gateway Transit Center Tenant Improvements Project (Grant Bailey) (Pages 343-353)**

**Recommendation:** That the Napa Valley Transportation Authority (NVTA) Board authorize the Executive Director to execute and make minor modifications to Project Work Order No. 23-OCE12-E07 with TYLin for Construction Management and Inspection Services for the Soscol Gateway Transit Center Tenant Improvements project in an amount not to exceed \$199,000.

**Estimated Time:** 2:30 p.m.

**Attachments:** [Staff Report](#)

**11.3 On-Call Task Orders with TYLin (Grant Bailey) (Pages 354-360)**

**Recommendation:** That the Napa Valley Transportation Authority (NVTA) Board authorize the Executive Director to execute and make minor modifications to:

1. Amendment No. 1 to Project Work Order No. 23-OCE12-E01 with TYLin for technical support with transit signal priority (TSP) equipment on the State Route (SR) 29 corridor, increasing the contract value by \$55,792 for a total amount not to exceed \$100,000; and
2. Amendment No. 1 to Project Work Order No. 23-OCE12-E02 with TYLin for engineering staff support services, increasing the contract value by \$130,370 for a total amount not to exceed \$200,000.

**Estimated Time:** 2:40 p.m.

**Attachments:** [Staff Report](#)

**11.4 Free Transit and Fare Subsidy Programs (Kate Miller) (Pages 361-406)**

**Recommendation:** That the Napa Valley Transportation Authority (NVTA) Board receive a report on the costs to subsidize fixed route fares for K-12, Low Income Adults and Elderly and/or Disabled riders.

**Estimated Time:** 2:50 p.m.

**Attachments:** [Staff Report](#)

**11.5 Federal and State Legislative Update (Kate Miller) (Pages 407-431)**

**Recommendation:** That the Napa Valley Transportation Authority (NVTA) Board receive the Federal Legislative update, State Legislative Update, and the State Bill Matrix.

**Estimated Time:** 3:00 p.m.

**Attachments:** [Staff Report](#)

**12. CLOSED SESSION****12.1 PUBLIC EMPLOYMENT**  
(Pursuant to Government Code Section 54957(b)(1))  
Title: Executive Director

**Estimated Time:** 3:10 p.m.

**13. FUTURE AGENDA ITEMS****14. ADJOURNMENT****14.1 The next Regular Meeting is December 18, 2024.**

I hereby certify that the agenda for the above stated meeting was posted at a location freely accessible to members of the public at the NVTA Offices, 625 Burnell Street, Napa, CA by 5:00 p.m. by Friday, November 15th.

  
\_\_\_\_\_  
Laura M. Sanderlin, NVTA Board Secretary

## Glossary of Acronyms

<b>AB 32</b>	Global Warming Solutions Act	<b>FAS</b>	Federal Aid Secondary
<b>ABAG</b>	Association of Bay Area Governments	<b>FAST</b>	Fixing America's Surface Transportation Act
<b>ACFR</b>	Annual Comprehensive Financial Report	<b>FHWA</b>	Federal Highway Administration
<b>ADA</b>	American with Disabilities Act	<b>FTA</b>	Federal Transit Administration
<b>APA</b>	American Planning Association	<b>FY</b>	Fiscal Year
<b>ATAC</b>	Active Transportation Advisory Committee	<b>GHG</b>	Greenhouse Gas
<b>ATP</b>	Active Transportation Program	<b>GGRF</b>	Greenhouse Gas Reduction Fund
<b>BAAQMD</b>	Bay Area Air Quality Management District	<b>GTFS</b>	General Transit Feed Specification
<b>BAB</b>	Build America Bureau	<b>HBP</b>	Highway Bridge Program
<b>BART</b>	Bay Area Rapid Transit District	<b>HBRR</b>	Highway Bridge Replacement and Rehabilitation Program
<b>BATA</b>	Bay Area Toll Authority	<b>HIP</b>	Housing Incentive Program
<b>BIL</b>	Bipartisan Infrastructure Law (IIJA)	<b>HOT</b>	High Occupancy Toll
<b>BRT</b>	Bus Rapid Transit	<b>HOV</b>	High Occupancy Vehicle
<b>CAC</b>	Citizen Advisory Committee	<b>HR3</b>	High Risk Rural Roads
<b>CAP</b>	Climate Action Plan	<b>HSIP</b>	Highway Safety Improvement Program
<b>CAPTI</b>	Climate Action Plan for Transportation Infrastructure	<b>HTF</b>	Highway Trust Fund
<b>Caltrans</b>	California Department of Transportation	<b>HUTA</b>	Highway Users Tax Account
<b>CASA</b>	Committee to House the Bay Area	<b>HVIP</b>	Hybrid & Zero-Emission Truck and Bus Voucher Incentive Program
<b>CBTP</b>	Community Based Transportation Plan	<b>IFB</b>	Invitation for Bid
<b>CEQA</b>	California Environmental Quality Act	<b>ITIP</b>	State Interregional Transportation Improvement Program
<b>CIP</b>	Capital Investment Program	<b>ITOC</b>	Independent Taxpayer Oversight Committee
<b>CMA</b>	Congestion Management Agency	<b>IS/MND</b>	Initial Study/Mitigated Negative Declaration
<b>CMAQ</b>	Congestion Mitigation and Air Quality Improvement Program	<b>JARC</b>	Job Access and Reverse Commute
<b>CMP</b>	Congestion Management Program	<b>LCTOP</b>	Low Carbon Transit Operations Program
<b>CalSTA</b>	California State Transportation Agency	<b>LIFT</b>	Low-Income Flexible Transportation
<b>CTA</b>	California Transit Association	<b>LOS</b>	Level of Service
<b>CTP</b>	Countywide Transportation Plan	<b>LS&amp;R</b>	Local Streets & Roads
<b>CTC</b>	California Transportation Commission	<b>LTF</b>	Local Transportation Fund
<b>CY</b>	Calendar Year	<b>MaaS</b>	Mobility as a Service
<b>DAA</b>	Design Alternative Analyst	<b>MAP 21</b>	Moving Ahead for Progress in the 21 <sup>st</sup> Century Act
<b>DBB</b>	Design-Bid-Build	<b>MPO</b>	Metropolitan Planning Organization
<b>DBE</b>	Disadvantaged Business Enterprise	<b>MTC</b>	Metropolitan Transportation Commission
<b>DBF</b>	Design-Build-Finance	<b>MTS</b>	Metropolitan Transportation System
<b>DBFOM</b>	Design-Build-Finance-Operate-Maintain	<b>ND</b>	Negative Declaration
<b>DED</b>	Draft Environmental Document	<b>NEPA</b>	National Environmental Policy Act
<b>EIR</b>	Environmental Impact Report	<b>NOAH</b>	Natural Occurring Affordable Housing
<b>EJ</b>	Environmental Justice	<b>NOC</b>	Notice of Completion
<b>EPC</b>	Equity Priority Communities	<b>NOD</b>	Notice of Determination
<b>ETID</b>	Electronic Transit Information Displays		



## Glossary of Acronyms

<b>NOP</b>	Notice of Preparation	<b>SHA</b>	State Highway Account
<b>NVTA</b>	Napa Valley Transportation Authority	<b>SHOPP</b>	State Highway Operation and Protection Program
<b>NVTA-TA</b>	Napa Valley Transportation Authority-Tax Agency	<b>SNTDM</b>	Solano Napa Travel Demand Model
<b>OBAG</b>	One Bay Area Grant	<b>SR</b>	State Route
<b>PA&amp;ED</b>	Project Approval Environmental Document	<b>SRTS</b>	Safe Routes to School
<b>P3 or PPP</b>	Public-Private Partnership	<b>SOV</b>	Single-Occupant Vehicle
<b>PCC</b>	Paratransit Coordination Council	<b>STA</b>	State Transit Assistance
<b>PCI</b>	Pavement Condition Index	<b>STIC</b>	Small Transit Intensive Cities
<b>PCA</b>	Priority Conservation Area	<b>STIP</b>	State Transportation Improvement Program
<b>PDA</b>	Priority Development Areas	<b>STP</b>	Surface Transportation Program
<b>PID</b>	Project Initiation Document	<b>TAC</b>	Technical Advisory Committee
<b>PIR</b>	Project Initiation Report	<b>TCM</b>	Transportation Control Measure
<b>PMS</b>	Pavement Management System	<b>TCRP</b>	Traffic Congestion Relief Program
<b>Prop. 42</b>	Statewide Initiative that requires a portion of gasoline sales tax revenues be designated to transportation purposes	<b>TDA</b>	Transportation Development Act
<b>PSE</b>	Plans, Specifications and Estimates	<b>TDM</b>	Transportation Demand Management Transportation Demand Model
<b>PSR</b>	Project Study Report	<b>TE</b>	Transportation Enhancement
<b>PTA</b>	Public Transportation Account	<b>TEA</b>	Transportation Enhancement Activities
<b>RACC</b>	Regional Agency Coordinating Committee	<b>TEA 21</b>	Transportation Equity Act for the 21 <sup>st</sup> Century
<b>RAISE</b>	Rebuilding American Infrastructure with Sustainability and Equity	<b>TFCA</b>	Transportation Fund for Clean Air
<b>RFP</b>	Request for Proposal	<b>TIP</b>	Transportation Improvement Program
<b>RFQ</b>	Request for Qualifications	<b>TIFIA</b>	Transportation Infrastructure Finance and Innovation Act
<b>RHNA</b>	Regional Housing Needs Allocation	<b>TIRCP</b>	Transit and Intercity Rail Capital Program
<b>RM 2</b>	Regional Measure 2 Bridge Toll	<b>TLC</b>	Transportation for Livable Communities
<b>RM 3</b>	Regional Measure 3 Bridge Toll	<b>TLU</b>	Transportation and Land Use
<b>RMRP</b>	Road Maintenance and Rehabilitation Program	<b>TMP</b>	Traffic Management Plan
<b>ROW (R/W)</b>	Right of Way	<b>TMS</b>	Transportation Management System
<b>RTEP</b>	Regional Transit Expansion Program	<b>TNC</b>	Transportation Network Companies
<b>RTIP</b>	Regional Transportation Improvement Program	<b>TOAH</b>	Transit Oriented Affordable Housing
<b>RTP</b>	Regional Transportation Plan	<b>TOC</b>	Transit Oriented Communities
<b>SAFE</b>	Service Authority for Freeways and Expressways	<b>TOD</b>	Transit-Oriented Development
<b>SAFETEA-LU</b>	Safe, Accountable, Flexible, and Efficient Transportation Equity Act-A Legacy for Users	<b>TOS</b>	Transportation Operations Systems
<b>SB 375</b>	Sustainable Communities and Climate Protection Act 2008	<b>TPA</b>	Transit Priority Area
<b>SB 1</b>	The Road Repair and Accountability Act of 2017	<b>TPI</b>	Transit Performance Initiative
<b>SCS</b>	Sustainable Community Strategy	<b>TPP</b>	Transit Priority Project Areas
		<b>VHD</b>	Vehicle Hours of Delay
		<b>VMT</b>	Vehicle Miles Traveled



## NAPA VALLEY TRANSPORTATION AUTHORITY COVER MEMO

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### **SUBJECT**

Resolution No. 24-17 Amending the Bylaws of the Napa Valley Transportation Authority (NVTA)

### **STAFF RECOMMENDATION**

That the Napa Valley Transportation Authority (NVTA) approve Resolution No. 24-17 (Attachment 1) amending the bylaws of the governing body.

### **EXECUTIVE SUMMARY**

A recent review of the NVTA governing body bylaws determined that administrative updates are needed under *Section IV – Meetings*. Board approval of Resolution No. 24-17 will bring the bylaws into conformance with the current process of establishing regular meeting times.

### **FISCAL IMPACT**

Is there a fiscal impact?    No



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## NAPA VALLEY TRANSPORTATION AUTHORITY Board Agenda Letter

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**TO:** NVTA Board of Directors  
**FROM:** Kate Miller, Executive Director  
**REPORT BY:** Laura Sanderlin, Board Secretary/Human Resources  
(707) 259-8633 / Email: [lsanderlin@nvta.ca.gov](mailto:lsanderlin@nvta.ca.gov)  
**SUBJECT:** Resolution No. 24-17 Amending the Bylaws of the Napa Valley Transportation Authority (NVTA)

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### **RECOMMENDATION**

That the Napa Valley Transportation Authority (NVTA) approve Resolution No. 24-17 (Attachment 1) amending the bylaws of the governing body.

### **COMMITTEE RECOMMENDATION**

None

### **BACKGROUND**

The Napa Valley Transportation Authority (NVTA) Governing Board meetings are subject to the requirements of the State of California's Brown Act and must establish a regular meeting time, place, and schedule, and publish notice of each meeting. Considering changes to the availability of appointed Directors since the last review conducted in 2016, the specified meeting time reflected in bylaws *Section IV-Meetings* must be amended.

### **ALTERNATIVES**

The Board may elect not to approve Resolution No. 24-17 and keep the current bylaws which may prevent obtaining quorum for meetings of the governing board.

### **ATTACHMENT(S)**

- (1) Resolution No. 24-17 (Clean)
- (2) Resolution No. 24-17 (Redlined)

**RESOLUTION NO. 24-17**

**RESOLUTION OF THE  
NAPA VALLEY TRANSPORTATION AUTHORITY (NVTA)  
AMENDING THE BYLAWS OF THE  
NAPA VALLEY TRANSPORTATION AUTHORITY**

**WHEREAS**, pursuant to Section 9 of the Joint Powers Agreement of the Napa Valley Transportation Authority (“Agreement”) the governing board of the NVTA ("NVTA Board") may from time to time adopt bylaws for the conduct of the affairs of NVTA and the NVTA Board; and

**WHEREAS**, on April 20, 2016, the NVTA Board approved Resolution 16-08 to amend the bylaws to bring them into conformance with changes made to NVTA by Amendment No. 10 of the Agreement reflecting the new name of the NVTA Board; and

**WHEREAS**, the NVTA Board now desires to amend the bylaws and make updates to Article IV – Meetings in Section 4.0 and 4.1 to set current process of setting regular meeting time; and

**NOW, THEREFORE, BE IT RESOLVED** by the NVTA Board that the Bylaws of the NVTA shall be those Bylaws set forth in Exhibit "A", attached hereto and incorporated as if set forth herein.

**THE FOREGOING RESOLUTION WAS DULY AND REGULARLY INTRODUCED, PASSED AND ADOPTED** by the Board of the Napa Valley Transportation Authority at a regular meeting of the Board held on the 20<sup>th</sup> day of November, 2024.

\_\_\_\_\_  
Mark Joseph, NVTA Chair

Ayes:

Nays:

Absent:

ATTEST:

\_\_\_\_\_  
Laura Sanderlin, NVTA Board Secretary

APPROVED:

\_\_\_\_\_  
Osman Mufti, NVTA Legal Counsel

## CERTIFICATE OF SECRETARY

I, the undersigned, certify that I am the presently designated and acting Secretary of the Napa Valley Transportation Authority, a joint powers agency created pursuant to the Joint Powers Act (California Government Code section 6500 et seq.) and that the above Bylaws are the Bylaws of this Authority and the governing Board thereof as adopted at a meeting of the Board held on November 20, 2024. Executed on November 20, 2024, at Napa, California.

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Laura Sanderlin  
Secretary of the NVTA Board

## EXHIBIT "A"

### **BYLAWS OF THE NAPA VALLEY TRANSPORTATION AUTHORITY**

#### **ARTICLE I – NAME**

**Section 1.0** The name of the agency is the Napa Valley Transportation Authority (hereinafter referred to as "NVTA"), a joint powers agency created pursuant to the Joint Powers Act (California Government Code section 6500 et seq.).

#### **ARTICLE II – PRINCIPAL OFFICE**

**Section 2.0** The principal office for the transaction of the activities and affairs of the NVTA is located at 625 Burnell Street, California 94559. The governing board of the NVTA ("hereinafter referred to as "NVTA Board") may change the location of the office by oral resolution noted by the Secretary in the Minutes of the Board or by written resolution amending these Bylaws.

#### **ARTICLE III – OFFICERS**

**Section 3.0** The officers of the NVTA Board shall be the Chair, Vice-Chair, Secretary and the Executive Director, Legal Counsel, Auditor-Controller and Treasurer of the NVTA. The Chair, Vice-Chair, Secretary, Executive Director and Legal Counsel shall be appointed by the NVTA Board. The Auditor-Controller and Treasurer shall be those persons specified in the Joint Powers Agreement.

**Section 3.0.1 Duties of Chair.** The Chair shall preside at all meetings of the NVTA Board. Except as otherwise authorized by resolution of the NVTA Board, the Chair shall sign all contracts and other instruments made by the Authority.

**Section 3.0.2 Duties of Vice-Chair.** The Vice-Chair shall perform the duties of the Chair in the absence or incapacity of the Chair. In case of the resignation or death of the Chair, the Vice-Chair shall perform such duties as are imposed on the Chair until such time as the NVTA Board shall elect a new Chair.

**Section 3.0.3 Duties of Secretary.** The Secretary shall keep the official records of the NVTA Board, shall act as secretary of the meetings of the NVTA Board, record all votes, and keep a record (hereinafter referred to as "Minutes") of the proceedings of the NVTA Board in a journal of proceedings kept for that purpose, and shall perform all other duties incident to the office. The Secretary shall keep in safe custody any seal the NVTA may adopt and shall have power to affix such seal to all contracts and instruments authorized to be executed by the NVTA.

**Section 3.0.4 Other Duties of Officers.** The officers of the NVTA Board shall perform such other duties and functions as may from time to time be required by these Bylaws, other Resolutions of the NVTA Board or the Joint Powers Agreement.

**Section 3.1 Compensation.** The Chair and Vice-Chair shall serve without compensation unless otherwise provided by Resolution of the NVTA Board.

**Section 3.2 Election of Chair and Vice-Chair.** The Chair and Vice-Chair shall be elected for a two-year term with an annual vote of approval from among the Members of the NVTA Board at their annual meeting or until their successors are elected and qualified.

**Section 3.3 Removal of Officers.** The Chair, Vice-Chair, Secretary, Treasurer, and Executive Director may be removed at any time, with or without cause, by vote of the NVTA Board. The Auditor-Controller may be removed only by amendment of the Joint Powers Agreement or removal from his or her respective position as an officer of Napa County. Any officer may resign at any time by giving written notice to the NVTA Board, with such resignation to take effect as of the date the notice is received or at any later time specified in the notice.

**Section 3.4 Vacancy in Office of Chair ,Vice-Chair or Secretary.** If the offices of Chair or Vice-Chair become vacant during their terms, the NVTA Board shall elect a successor from its membership at the next regular meeting, and election shall be for the unexpired term of the office. If both offices are vacant simultaneously, the Secretary shall preside over the meeting for the sole purpose of electing a new Chair and Vice-Chair. When the office of Secretary becomes vacant, the Authority shall appoint a permanent successor as soon as is reasonably possible but may appoint any person, including a Member of the NVTA Board or NVTA staff, to serve as interim Secretary pending appointment of a permanent Secretary.

## **ARTICLE IV – MEETINGS**

**Section 4.0 Annual Meeting.** The annual meeting of the NVTA Board shall be held on the third Wednesday of July at the regular time and meeting place of the NVTA Board, or as soon thereafter as the meeting may be conducted.

**Section 4.1 Regular Meetings.** Regular meetings of the NVTA Board in addition to the annual meeting shall be held on the third Wednesday of each month at the time and meeting location established by written Resolution of the NVTA Board adopting the annual meeting calendar, or written Resolution amending these Bylaws.

**Section 4.2 Special Meetings.** The Chair may, in the discretion of, or upon the written request of two Members of the NVTA Board, call a special meeting of the NVTA Board for the purpose of transacting any business designated in the call and agenda posted for the special meeting in accordance with the Brown Act. The call for a special meeting shall be made in accordance with the requirements of Government Code section 54956.

**Section 4.3 Conduct of Meetings.** All of the meetings of the NVTA Board shall be open to the public, whether regular or special, and shall be noticed and conducted in accordance with the provisions of the Ralph M. Brown Act (Chapter 9 of Part 1 of Division 2 of Title 5 (commencing with Section 54950) of the California Government Code), hereinafter referred to as "Brown Act".

**Section 4.3.1 Addressing the NVTA Board.** Any person desiring to address the NVTA Board, including during any period of public comment required under the Brown Act shall, when recognized by the Chair, give his or her name or address and, if acting on behalf of another person, the name and address of that person. The Chair may, in the interest of facilitating the business of the NVTA Board, limit the amount of time which a person may use in addressing the NVTA Board, determine the admissibility of evidence, and may require persons addressing the NVTA Board to submit written testimony in lieu of oral if the Chair determines that a reasonable opportunity for oral presentations has been provided. This Bylaw shall not apply to Members or Non-Member Officers of the NVTA Board except when specifically requested by the Chair in relation to a particular item of business.

**Section 4.3.2 Order of Presentation.** Testimony and argument relative to any agenda item, whether or not a public hearing is involved, shall, unless otherwise ordered by the Chair, be presented in the following order:

- a. The Chair shall identify the matter and, if the matter is a public hearing, declare the public hearing open.
- b. The report(s), if any, of the NVTA staff shall be presented and staff shall respond to questions from Members of the NVTA Board.
- c. Letters, petitions, or other documentary evidence filed with the Secretary by any person prior to consideration of the item shall be presented to the NVTA Board and may be considered by the NVTA Board when deciding the action before it. All such evidence shall become part of the NVTA Board's file on the agenda item. If such evidence has been received by the Secretary prior to preparation of agenda packets for the meeting, the Secretary shall include copies of the evidence in the packet. If such evidence is received prior to consideration of the item but subsequent to preparation of the agenda packet, the Secretary shall make copies of the evidence available to each Member of the NVTA Board and to the public in attendance at the meeting prior to the NVTA Board taking final action on the item.
- d. Persons wishing to speak in favor of the matter, or with additional information although having no particular stance, shall be heard, and shall respond to questions by Members and Non-Member Officers of the NVTA Board.
- e. Persons wishing to speak in opposition to the matter shall be heard and shall respond to questions by Members and Non-Member Officers of the NVTA Board.
- e. Rebuttal in the same order (if any), including response to questions by Members and Non-Member Officers of the NVTA Board.
- g. Discussion by Members of the NVTA Board. Any Members who have obtained information relevant to the agenda item outside of the meeting which has not been presented at the meeting by any other person, shall describe such information and the manner in which it was obtained.
- h. Closure of the public hearing, if any.
- i. Voting.

**Section 4.3.3 Rules of Evidence.** Cumulative, repetitious, immaterial, irrelevant, abusive, derogatory, or defamatory evidence may be excluded by the Chair. Subject to



the foregoing, evidence shall be admissible if it is of a type commonly relied upon by reasonable and prudent persons in the conduct of serious affairs. Erroneous admission of evidence shall not invalidate any action taken unless it is shown in a court of law or equity to have prejudiced the substantial rights of a person directly affected by the action.

**Section 4.3.4 Exhibits.** All exhibits proffered by any person testifying at the meeting on an agenda item shall be marked by the Secretary upon submission with the agenda item number and a number or letter unique for each item marked, to provide identification in the event of later litigation. No item of graphic or documentary evidence shall be shown to the NVTA Board unless so marked and offered for submission. Except where otherwise specified by law, all exhibits so marked and submitted shall be retained by the Secretary until the expiration of all applicable statutes of limitation, at which time they will be returned to applicant. Unclaimed exhibits may be disposed of by the Secretary within ten (10) days after the expiration of the last applicable statute of limitations.

**Section 4.3.5 Recording.** Any meeting of the NVTA Board may be recorded by any person using any medium, unless the Chair determines that such recording method could disrupt the proceedings.

**Section 4.4 Parliamentary Procedure.** Unless otherwise inconsistent with the Joint Powers Agreement or these Bylaws, the meetings of the NVTA Board shall be conducted in accordance with the parliamentary procedure set forth in Sturgis' Standard Code of Parliamentary Procedure, 4th Edition.

**Section 4.5 NVTA Membership and Voting.** The number of Members of the NVTA Board and the number of votes each member of the Governing Board is entitled to cast on any question shall be as specified in the Joint Powers Agreement, as follows:

**Section 4.5.1 Membership.** The composition of the Members of the NVTA Board shall be as follows:

<u>Appointing Entity</u>	<u>Number of Members</u>
City of American Canyon	2
City of Calistoga	2
City of Napa	2
City of St. Helena	2
Town of Yountville	2
County of Napa	2
NVTA Board (nominated by Paratransit Coordinating Council)	1

**Section 4.5.2 Voting Power.** The voting power of the Members of the NVTA Board shall be as follows:

- (a) On all matters except the countywide advisory deliberative body under Section 5.2 (o) of the Joint Powers Agreement the voting power of the Members of the NVTA Board shall be as follows:

<u>Appointing Entity</u>	<u>Voting Power</u>
City of American Canyon	4 (each Member has 2 votes)
City of Calistoga	2 (each Member has one vote)
City of Napa	10 (each member has 5 votes)
City of St. Helena	2 (each Member has one vote)
Town of Yountville	2 (each Member has one vote)
County of Napa	4 (each Member has 2 votes)
NVTA Board (nominated by Paratransit Coordinating Council)	0 (non-voting)

(b) On all matters concerning powers under Section 5.2 (r) of the Joint Powers Agreement, each Voting Member shall have one vote.

**Section 4.5.1 Alternates.** In the absence of a voting Member, physically or by reason of a conflict of interest, the alternate appointed in accordance with the procedure specified in the Joint Powers Agreement shall vote in place of the absent Member as long as the alternate was either present during the presentation of all evidence presented on the matter or indicates on the record that he or she has reviewed all such evidence prior to participating in any NVTA Board discussion and vote. No proxy votes shall be permitted.

**Section 4.5.2 Quorum.** A majority of the voting power and seven of the twelve voting members (or their alternates) of the NVTA Board shall constitute a quorum for the transaction of business at any meeting of the NVTA Board. Notwithstanding the foregoing, if a quorum is present at the commencement of the meeting, the affirmative vote of a majority of the voting power of the NVTA Board shall constitute the act of the NVTA Board even if, at the time of such vote, less than seven voting members (or their alternates) are present.

**Section 4.5.3 Roll call vote.** A roll call vote may be required in voting upon any motion before the NVTA Board, in the discretion of the Chair. Any voting Member present and not barred from voting by a declared conflict of interest who does not vote in an audible voice or other method (such as electronic voting) simultaneously perceptible to the other Members, the Secretary and the public present, shall be recorded as voting "aye". Abstentions shall be allowed only when a voting Member has a declared conflict of interest.

**Section 4.5.4 Tie-votes.** In the case of a tie-vote or other deadlock, the Secretary shall automatically cause the item of business to be placed on the next agenda for reconsideration and vote. No motion shall be required to take such action. If all the voting Members who have not voted on the matter have not participated due to a conflict of interest and will, for that reason, be unable to vote even if the matter is continued to the next agenda, then the tie vote or deadlock shall constitute a final action of denial of the motion and the matter shall not be continued to the next agenda for reconsideration and vote.

**Section 4.6 Adjournment.** Any meeting of the NVTA Board may be adjourned from time to time by a vote of the majority of the voting power then present. If a quorum is not present, the meeting of the NVTA Board shall be adjourned by order of the Chair or, in the absence of the Chair, by order of the Secretary.

## **ARTICLE V - COMMITTEES OF THE BOARD**

**Section 5.0** In addition to the advisory committees authorized by the Joint Powers Agreement, the NVTA Board may create by resolution and without express amendment of these Bylaws one or more committees of the NVTA Board consisting of Members and/or alternate Members to serve at the pleasure of the NVTA Board. The NVTA Board may appoint one or more of the Members or alternate Members to serve as alternate members of any such committee, who may replace an absent member at any meeting. Such committees shall have those powers specifically delegated to them by the NVTA Board, to the extent not inconsistent with the provisions of the Joint Powers Agreement or these Bylaws.

## **ARTICLE VI - BUDGET PROCESS**

**Section 6.0** The annual budget for the NVTA shall be developed and adopted by the NVTA Board in accordance with the procedures and timelines applicable by law to the County of Napa.

## **ARTICLE VII - AMENDMENTS**

**Section 7.0.** Notwithstanding Section 4.6, these Bylaws shall be amended only with the approval of a majority of the voting power then present; except that no amendments of these Bylaws shall be effective unless at least seven (7) of the Members of the NVTA Board cast affirmative votes.

RESOLUTION NO. ~~16-08~~24-17

RESOLUTION OF THE  
NAPA VALLEY TRANSPORTATION AUTHORITY (NVTA)  
AMENDING THE BYLAWS OF THE  
NAPA VALLEY TRANSPORTATION AUTHORITY

**WHEREAS**, pursuant to Section 9 of the Joint Powers Agreement of the Napa Valley Transportation Authority ("Agreement") the governing board of the NVTA ("NVTA Board") may from time to time adopt bylaws for the conduct of the affairs of NVTA and the NVTA Board; and

~~**WHEREAS**, the NVTA Board now desires to amend the by laws to bring them into conformance with changes made to NVTA by Amendment No. 10 of the Agreement reflecting the new name of the NVTA Board.~~

~~**WHEREAS**, on April 20, 2016, the NVTA Board approved Resolution 16-08 to amend the bylaws to bring them into conformance with changes made to NVTA by Amendment No. 10 of the Agreement reflecting the new name of the NVTA Board; and~~

~~**WHEREAS**, the NVTA Board now desires to amend the bylaws and make updates to Article IV – Meetings in Section 4.0 and 4.1 to set current process of setting regular meeting time; and~~

**NOW, THEREFORE, BE IT RESOLVED** by the NVTA Board that the Bylaws of the NVTA shall be those Bylaws set forth in Exhibit "A", attached hereto and incorporated as if set forth herein.

**THE FOREGOING RESOLUTION WAS DULY AND REGULARLY INTRODUCED, PASSED AND ADOPTED** by the Board of the Napa Valley Transportation Authority at a regular meeting of the Board held on the 20<sup>th</sup> day of ~~November~~April, 20~~16~~24.

Ayes:

~~Mark Joseph~~John F. Dunbar, NVTA Chair

ATTEST:

~~Karalyn E. Laura~~ Sanderlin, NVTA Board Secretary

APPROVED:

~~Janice D. Killian~~Osman Mufti, NVTA Legal Counsel

CERTIFICATE OF SECRETARY

I, the undersigned, certify that I am the presently designated and acting Secretary of the Napa Valley Transportation Authority, a joint powers agency created pursuant to the Joint Powers Act (California Government Code section 6500 et seq.) and that the above Bylaws are the Bylaws of this Authority and the governing Board thereof as adopted at a meeting of the Board held on ~~April 20, 2016~~November 20, 2024. Executed on ~~April 20, 2016~~November 20, 2024, at Napa, California.

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~~Karalyn E. Laura~~ Sanderlin  
Secretary of the NVTA Board

EXHIBIT "A"

**BYLAWS OF THE NAPA VALLEY  
TRANSPORTATION AUTHORITY**

**ARTICLE I – NAME**

**Section 1.0** The name of the agency is the Napa Valley Transportation Authority (hereinafter referred to as "NVTA"), a joint powers agency created pursuant to the Joint Powers Act (California Government Code section 6500 et seq.).

**ARTICLE II – PRINCIPAL OFFICE**

**Section 2.0** The principal office for the transaction of the activities and affairs of the NVTA is located at 625 Burnell Street, California 94559. The governing board of the NVTA ("hereinafter referred to as "NVTA Board") may change the location of the office by oral resolution noted by the Secretary in the Minutes of the Board or by written resolution amending these Bylaws.

**ARTICLE III – OFFICERS**

**Section 3.0** The officers of the NVTA Board shall be the Chair, Vice-Chair, Secretary and the Executive Director, Legal Counsel, Auditor-Controller and Treasurer of the NVTA. The Chair, Vice-Chair, Secretary, Executive Director and Legal Counsel shall be appointed by the NVTA Board. The Auditor-Controller and Treasurer shall be those persons specified in the Joint Powers Agreement.

**Section 3.0.1 Duties of Chair.** The Chair shall preside at all meetings of the NVTA Board. Except as otherwise authorized by resolution of the NVTA Board, the Chair shall sign all contracts and other instruments made by the Authority.

**Section 3.0.2 Duties of Vice-Chair.** The Vice-Chair shall perform the duties of the Chair in the absence or incapacity of the Chair. In case of the resignation or death of the Chair, the Vice-Chair shall perform such duties as are imposed on the Chair until such time as the NVTA Board shall elect a new Chair.

**Section 3.0.3 Duties of Secretary.** The Secretary shall keep the official records of the NVTA Board, shall act as secretary of the meetings of the NVTA Board, record all votes, and keep a record (hereinafter referred to as "Minutes") of the proceedings of the NVTA Board in a journal of proceedings kept for that purpose, and shall perform all other duties incident to the office. The Secretary shall keep in safe custody any seal the NVTA may adopt and shall have power to affix such seal to all contracts and instruments authorized to be executed by the NVTA.

**Section 3.0.4 Other Duties of Officers.** The officers of the NVTA Board shall perform such other duties and functions as may from time to time be required by these Bylaws, other Resolutions of the NVTA Board or the Joint Powers Agreement.

**Section 3.1 Compensation.** The Chair and Vice-Chair shall serve without compensation unless otherwise provided by Resolution of the NVTA Board.

**Section 3.2 Election of Chair and Vice-Chair.** The Chair and Vice-Chair shall be elected for a two-year term with an annual vote of approval from among the Members of the NVTA Board at their annual meeting or until their successors are elected and qualified.

**Section 3.3 Removal of Officers.** The Chair, Vice-Chair, Secretary, Treasurer, and Executive Director may be removed at any time, with or without cause, by vote of the NVTA Board. The Auditor-Controller may be removed only by amendment of the Joint Powers Agreement or removal from his or her respective position as an officer of Napa County. Any officer may resign at any time by giving written notice to the NVTA Board, with such resignation to take effect as of the date the notice is received or at any later time specified in the notice.

**Section 3.4 Vacancy in Office of Chair, Vice-Chair or Secretary.** If the offices of Chair or Vice-Chair become vacant during their terms, the NVTA Board shall elect a successor from its membership at the next regular meeting, and election shall be for the unexpired term of the office. If both offices are vacant simultaneously, the Secretary shall preside over the meeting for the sole purpose of electing a new Chair and Vice-Chair. When the office of Secretary becomes vacant, the Authority shall appoint a permanent successor as soon as is reasonably possible but may appoint any person, including a Member of the NVTA Board or NVTA staff, to serve as interim Secretary pending appointment of a permanent Secretary.

## ARTICLE IV – MEETINGS

**Section 4.0 Annual Meeting.** The annual meeting of the NVTA Board shall be held on the third Wednesday of July ~~at 1:30 p.m.,~~ at the regular meeting place of the NVTA Board, or as soon thereafter as the meeting may be conducted.

**Section 4.1 Regular Meetings.** Regular meetings of the NVTA Board in addition to the annual meeting shall be held on the third Wednesday of each ~~month at 1:30 p.m. or on such other date and time as the NVTA Board may specify by oral Resolution noted in the minutes of the NVTA Board or written Resolution amending these Bylaws.~~ month at the time and meeting location established by written Resolution of the the annual-NVTA Board adopting the annual meeting calendar, adopted by the NVTA Board, or written Resolution amending these Bylaws.

**Section 4.2 Special Meetings.** The Chair may, in the discretion of, or upon the written request of two Members of the NVTA Board, call a special meeting of the NVTA Board for the purpose of transacting any business designated in the call and agenda posted for the special meeting in accordance with the Brown Act. The call for a special meeting shall be made in accordance with the requirements of Government Code section 54956.

**Section 4.3 Conduct of Meetings.** All of the meetings of the NVTA Board shall be open to the public, whether regular or special, and shall be noticed and conducted in accordance with the provisions of the Ralph M. Brown Act (Chapter 9 of Part 1 of Division

2 of Title 5 (commencing with Section 54950) of the California Government Code), hereinafter referred to as "Brown Act".

**Section 4.3.1 Addressing the NVTA Board.** Any person desiring to address the NVTA Board, including during any period of public comment required under the Brown Act shall, when recognized by the Chair, give his or her name or address and, if acting on behalf of another person, the name and address of that person. The Chair may, in the interest of facilitating the business of the NVTA Board, limit the amount of time which a person may use in addressing the NVTA Board, determine the admissibility of evidence, and may require persons addressing the NVTA Board to submit written testimony in lieu of oral if the Chair determines that a reasonable opportunity for oral presentations has been provided. This Bylaw shall not apply to Members or Non-Member Officers of the NVTA Board except when specifically requested by the Chair in relation to a particular item of business.

**Section 4.3.2 Order of Presentation.** Testimony and argument relative to any agenda item, whether or not a public hearing is involved, shall, unless otherwise ordered by the Chair, be presented in the following order:

- a. The Chair shall identify the matter and, if the matter is a public hearing, declare the public hearing open.
- b. The report(s), if any, of the NVTA staff shall be presented and staff shall respond to questions from Members of the NVTA Board.
- c. Letters, petitions, or other documentary evidence filed with the Secretary by any person prior to consideration of the item shall be presented to the NVTA Board and may be considered by the NVTA Board when deciding the action before it. All such evidence shall become part of the NVTA Board's file on the agenda item. If such evidence has been received by the Secretary prior to preparation of agenda packets for the meeting, the Secretary shall include copies of the evidence in the packet. If such evidence is received prior to consideration of the item but subsequent to preparation of the agenda packet, the Secretary shall make copies of the evidence available to each Member of the NVTA Board and to the public in attendance at the meeting prior to the NVTA Board taking final action on the item.
- d. Persons wishing to speak in favor of the matter, or with additional information although having no particular stance, shall be heard, and shall respond to questions by Members and Non-Member Officers of the NVTA Board.
- e. Persons wishing to speak in opposition to the matter shall be heard and shall respond to questions by Members and Non-Member Officers of the NVTA Board.
- e. Rebuttal in the same order (if any), including response to questions by Members and Non-Member Officers of the NVTA Board.
- g. Discussion by Members of the NVTA Board. Any Members who have obtained information relevant to the agenda item outside of the meeting which has not been presented at the meeting by any other person, shall describe such information and the manner in which it was obtained.
- h. Closure of the public hearing, if any.
- i. Voting.



**Section 4.3.3 Rules of Evidence.** Cumulative, repetitious, immaterial, irrelevant, abusive, derogatory, or defamatory evidence may be excluded by the Chair. Subject to the foregoing, evidence shall be admissible if it is of a type commonly relied upon by reasonable and prudent persons in the conduct of serious affairs. Erroneous admission of evidence shall not invalidate any action taken unless it is shown in a court of law or equity to have prejudiced the substantial rights of a person directly affected by the action.

**Section 4.3.4 Exhibits.** All exhibits proffered by any person testifying at the meeting on an agenda item shall be marked by the Secretary upon submission with the agenda item number and a number or letter unique for each item marked, to provide identification in the event of later litigation. No item of graphic or documentary evidence shall be shown to the NVTA Board unless so marked and offered for submission. Except where otherwise specified by law, all exhibits so marked and submitted shall be retained by the Secretary until the expiration of all applicable statutes of limitation, at which time they will be returned to applicant. Unclaimed exhibits may be disposed of by the Secretary within ten (10) days after the expiration of the last applicable statute of limitations.

**Section 4.3.5 Recording.** Any meeting of the NVTA Board may be recorded by any person using any medium, unless the Chair determines that such recording method could disrupt the proceedings.

**Section 4.4 Parliamentary Procedure.** Unless otherwise inconsistent with the Joint Powers Agreement or these Bylaws, the meetings of the NVTA Board shall be conducted in accordance with the parliamentary procedure set forth in Sturgis' Standard Code of Parliamentary Procedure, 4th Edition.

**Section 4.5 NVTA Membership and Voting.** The number of Members of the NVTA Board and the number of votes each member of the Governing Board is entitled to cast on any question shall be as specified in the Joint Powers Agreement, as follows:

**Section 4.5.1 Membership.** The composition of the Members of the NVTA Board shall be as follows:

<u>Appointing Entity</u>	<u>Number of Members</u>
City of American Canyon	2
City of Calistoga	2
City of Napa	2
City of St. Helena	2
Town of Yountville	2
County of Napa	2
NVTA Board (nominated by Paratransit Coordinating Council)	1

**Section 4.5.2 Voting Power.** The voting power of the Members of the NVTA Board shall be as follows:

(a) On all matters except the countywide advisory deliberative body under Section 5.2 (o) of the Joint Powers Agreement the voting power of the Members of the NVT Board shall be as follows:

<u>Appointing Entity</u>	<u>Voting Power</u>
City of American Canyon	4 (each Member has 2 votes)
City of Calistoga	2 (each Member has one vote)
City of Napa	10 (each member has 5 votes)
City of St. Helena	2 (each Member has one vote)
Town of Yountville	2 (each Member has one vote)
County of Napa	4 (each Member has 2 votes)
NVTA Board (nominated by Paratransit Coordinating Council)	0 (non-voting)

(b) On all matters concerning powers under Section 5.2 (r) of the Joint Powers Agreement, each Voting Member shall have one vote.

**Section 4.5.1 Alternates.** In the absence of a voting Member, physically or by reason of a conflict of interest, the alternate appointed in accordance with the procedure specified in the Joint Powers Agreement shall vote in place of the absent Member as long as the alternate was either present during the presentation of all evidence presented on the matter or indicates on the record that he or she has reviewed all such evidence prior to participating in any NVTA Board discussion and vote. No proxy votes shall be permitted.

**Section 4.5.2 Quorum.** A majority of the voting power and seven of the twelve voting members (or their alternates) of the NVTA Board shall constitute a quorum for the transaction of business at any meeting of the NVTA Board. Notwithstanding the foregoing, if a quorum is present at the commencement of the meeting, the affirmative vote of a majority of the voting power of the NVTA Board shall constitute the act of the NVTA Board even if, at the time of such vote, less than seven voting members (or their alternates) are present.

**Section 4.5.3 Roll call vote.** A roll call vote may be required in voting upon any motion before the NVTA Board, in the discretion of the Chair. Any voting Member present and not barred from voting by a declared conflict of interest who does not vote in an audible voice or other method (such as electronic voting) simultaneously perceptible to the other Members, the Secretary and the public present, shall be recorded as voting "aye". Abstentions shall be allowed only when a voting Member has a declared conflict of interest.

**Section 4.5.4 Tie-votes.** In the case of a tie-vote or other deadlock, the Secretary shall automatically cause the item of business to be placed on the next agenda for reconsideration and vote. No motion shall be required to take such action. If all the voting Members who have not voted on the matter have not participated due to a conflict of interest and will, for that reason, be unable to vote even if the matter is continued to the next agenda, then the tie vote or deadlock shall constitute a final action of denial of the

motion and the matter shall not be continued to the next agenda for reconsideration and vote.

**Section 4.6 Adjournment.** Any meeting of the NVTA Board may be adjourned from time to time by a vote of the majority of the voting power then present. If a quorum is not present, the meeting of the NVTA Board shall be adjourned by order of the Chair or, in the absence of the Chair, by order of the Secretary.

## **ARTICLE V - COMMITTEES OF THE BOARD**

**Section 5.0** In addition to the advisory committees authorized by the Joint Powers Agreement, the NVTA Board may create by resolution and without express amendment of these Bylaws one or more committees of the NVTA Board consisting of Members and/or alternate Members to serve at the pleasure of the NVTA Board. The NVTA Board may appoint one or more of the Members or alternate Members to serve as alternate members of any such committee, who may replace an absent member at any meeting. Such committees shall have those powers specifically delegated to them by the NVTA Board, to the extent not inconsistent with the provisions of the Joint Powers Agreement or these Bylaws.

## **ARTICLE VI - BUDGET PROCESS**

**Section 6.0** The annual budget for the NVTA shall be developed and adopted by the NVTA Board in accordance with the procedures and timelines applicable by law to the County of Napa.

## **ARTICLE VII - AMENDMENTS**

**Section 7.0.** Notwithstanding Section 4.6, these Bylaws shall be amended only with the approval of a majority of the voting power then present; except that no amendments of these Bylaws shall be effective unless at least seven (7) of the Members of the NVTA Board cast affirmative votes.



## NAPA VALLEY TRANSPORTATION AUTHORITY COVER MEMO

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### **SUBJECT**

Resolution No. 24-15 Setting the Regular Meeting Time, Place, and Schedule of the Napa Valley Transportation Authority (NVTA) Governing Board for Calendar Year (CY) 2025

### **STAFF RECOMMENDATION**

That the Napa Valley Transportation Authority (NVTA) Board approve Resolution No. 24-15 (Attachment 1) setting the regular meeting time, place, and schedule of the NVTA Governing Board for Calendar Year (CY) 2025.

### **EXECUTIVE SUMMARY**

The NVTA Governing Board meetings are subject to the requirements of the State of California Brown Act, which necessitates the establishment of a regular meeting time and place and the publication of a notice for each meeting. Resolution No. 24-15 will set the regular meeting time for 1:00 PM, and regular meeting place as the NVTA Board Room at 625 Burnell Street, Napa CA 94559, and set the meeting schedule for CY 2025.

### **FISCAL IMPACT**

None



## NAPA VALLEY TRANSPORTATION AUTHORITY

### Board Agenda Memo

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**TO:** Board of Directors  
**FROM:** Kate Miller, Executive Director  
**REPORT BY:** Laura Sanderlin, Board Secretary/Human Resources  
(707) 259-8633 / Email: [lsanderlin@nvta.ca.gov](mailto:lsanderlin@nvta.ca.gov)  
**SUBJECT:** Resolution No. 24-15 Setting the Regular Meeting Time, Place, and Schedule of the Napa Valley Transportation Authority (NVTA) Governing Board for Calendar Year (CY) 2025

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#### **RECOMMENDATION**

That the Napa Valley Transportation Authority (NVTA) Board approve Resolution No. 24-15 (Attachment 1) setting the regular meeting time, place, and schedule of the NVTA Governing Board for Calendar Year (CY) 2025.

#### **COMMITTEE RECOMMENDATION**

None

#### **BACKGROUND**

The NVTA Governing Board meetings are subject to the requirements of the State of California's Brown Act, which necessitates the establishment of a regular meeting time and place and the publication of a notice for each meeting. Resolution No. 24-15 (Attachment 1) will set the regular meeting time at 1:00pm, set the regular meeting place as the NVTA Board Room at 625 Burnell Street, Napa CA 94559, and set the meeting schedule for CY 2025.

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The the recommended regular meeting schedule for CY 2025 is as follows:

Wednesday, January 15  
Wednesday, February 19  
Wednesday, March 19  
Wednesday, April 16  
Wednesday, May 21  
Wednesday, June 18  
Wednesday, July 16  
Wednesday, September 17  
Wednesday, October 15  
Wednesday, November 19  
Wednesday, December 17

**ALTERNATIVES**

The Board may elect not to approve Resolution No. 24-15. In doing so, the Agency will fail to comply with the State of California Brown Act requirements.

**STRATEGIC GOALS MET BY THIS PROPOSAL**

Not applicable

**ATTACHMENT**

(1) Resolution No. 24-15

**RESOLUTION No. 24-15**

**A RESOLUTION OF THE  
NAPA VALLEY TRANSPORTATION AUTHORITY (NVTA)  
SETTING THE REGULAR MEETING TIME, PLACE, AND SCHEDULE  
FOR THE GOVERNING BOARD  
FOR CALENDAR YEAR (CY) 2025**

**WHEREAS**, the Napa Valley Transportation Authority (NVTA) Governing Board meetings are subject to the requirements of the State of California’s Brown Act; and

**WHEREAS**, the NVTA Governing Board must establish a regular meeting time, place, and schedule, and publish notice of each meeting;

**NOW, THEREFORE BE IT RESOLVED** by the Governing Board of the Napa Valley Transportation Authority that:

1. The regular meeting dates for the Governing Board for calendar year 2025, as shown in Exhibit “A”, sets the regular time at 1:00 p.m. and sets the regular meeting place as the JoAnn Busenbark Board Room at 625 Burnell Street, Napa, CA 94559.

Passed and Adopted this 20<sup>th</sup> Day of November 2024.

\_\_\_\_\_  
Mark Joseph, NVTA Chair

Ayes:

Nays:

Absent:

ATTEST:

\_\_\_\_\_  
Laura Sanderlin, NVTA Board Secretary

APPROVED:

\_\_\_\_\_  
Osman Mufti, NVTA General Counsel

**EXHIBIT "A"**

NVTA Governing Board  
Meeting Dates for CY 2025

- Wednesday, January 15
- Wednesday, February 19
- Wednesday, March 19
- Wednesday, April 16
- Wednesday, May 21
- Wednesday, June 18
- Wednesday, July 16
- Wednesday, September 17
- Wednesday, October 15
- Wednesday, November 19
- Wednesday, December 17





## NAPA VALLEY TRANSPORTATION AUTHORITY COVER MEMO

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### **SUBJECT**

Resolution No. 24-16 Amending Napa Valley Transportation Authority (NVTA) Conflict of Interest Code

### **STAFF RECOMMENDATION**

That the Napa Valley Transportation Authority (NVTA) approve Resolution No. 24-16 (Attachment 1) amending the Conflict of Interest Code and direct the Secretary to forward it to the Napa County Board of Supervisors as the reviewing authority in Napa County.

### **EXECUTIVE SUMMARY**

A review of the Conflict of Interest Code determined that several positions have been created or re-titled since the Agency's Conflict Code was last reviewed. To comply with the Fair Political Practices Commission (FPPC) rules it is necessary that the Conflict of Interest Code be amended to reflect the changes.

### **FISCAL IMPACT**

Is there a fiscal impact?    No



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## NAPA VALLEY TRANSPORTATION AUTHORITY Board Agenda Letter

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**TO:** NVTA Board of Directors  
**FROM:** Kate Miller, Executive Director  
**REPORT BY:** Laura Sanderlin, Board Secretary/Human Resources  
(707) 259-8633 / Email: [lsanderlin@nvta.ca.gov](mailto:lsanderlin@nvta.ca.gov)  
**SUBJECT:** Resolution No. 24-16 Amending Napa Valley Transportation Authority  
(NVTA) Conflict of Interest Code

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### **RECOMMENDATION**

That the Napa Valley Transportation Authority (NVTA) approve Resolution No. 24-16 (Attachment 1) amending the Conflict of Interest Code and direct the Secretary to forward it to the Napa County Board of Supervisors as the reviewing authority in Napa County.

### **COMMITTEE RECOMMENDATION**

None

### **BACKGROUND**

The Fair Political Practices Commission (FPPC) issued rules related to public agency conflict of interest codes requiring public agencies to create conflict of interest codes and regularly review them to determine whether refinements are necessary.

A recent review of the Conflict of Interest Codes revealed that certain position titles need to be updated.

### **ALTERNATIVES**

The Board may elect not to approve the amended conflict of interest code, however, the Agency would fail to comply with the Fair Political Practices Commission (FPPC) rules related to public agency conflict of interest codes.

**ATTACHMENT(S)**

- (1) Resolution No. 24-16 (Clean)
- (2) Resolution No. 24-16 (Redlined)

**RESOLUTION NO. 24-16**

**A RESOLUTION OF THE  
NAPA VALLEY TRANSPORTATION AUTHORITY (NVTA)  
AMENDING THE AGENCY CONFLICT OF INTEREST CODE**

**WHEREAS**, on September 21, 1993, the Napa County Board of Supervisors, acting as the code reviewing body, approved the adoption of a Conflict of Interest Code for the Napa County Congestion Management Agency, as required by the Political Reform Act of 1974 (Government code sections 81000 et seq., hereinafter referred to as “Act”); and

**WHEREAS**, on or about May 13, 1998, the Napa County Congestion Management Agency was converted into and succeeded by the Napa County Transportation and Planning Agency (“NCTPA”), a joint powers agency organized under the Joint Exercise of Powers Act (Government Code section 6500 et seq.); and

**WHEREAS**, on September 18, 2002, the Board amended the NCTPA Conflict of Interest Code, to conform to changes made in the model conflict of interest code (“model code”) promulgated by the Fair Political Practices Commission (“FPPC”) and expand the list of designated positions and disclosure categories to reflect the current operations of the NCTPA in serving as the countywide transportation planning body for the incorporated and unincorporated areas within Napa County, and performing such transportation related duties and responsibilities as the Member Jurisdictions may delegate to NCTPA; and

**WHEREAS**, on November 14, 2012, the Board of NCTPA amended its Conflict of Interest Code in its entirety; and

**WHEREAS**, on November 19, 2014, the Board of NCTPA amended Appendix A of the Conflict of Interest Code in its entirety; and

**WHEREAS**, on February 17, 2016 the Board of the NCTPA approved Resolution No. 16-02 changing the name of the NCTPA to the Napa Valley Transportation Authority (NVTA or Authority), a Joint Powers Authority; and

**WHEREAS**, on June 15, 2016 the Board of NVTA amended its Conflict of Interest Code in its entirety; and

**WHEREAS**, on October 23, 2019 the Board of NVTA amended its Conflict of Interest Code in its entirety; and

**WHEREAS**, on October 19, 2022 the Board of NVTA amended its Conflict of Interest Code in its entirety; and

**WHEREAS**, it is now necessary to amend the Conflict of Interest Code in its entirety to reflect added and deleted management positions, and/or changes in management titles; and

**WHEREAS**, the Napa County Board of Supervisors, acting as the code reviewing body, will consider approval of this Resolution later in 2024.

**THEREFORE, BE IT RESOLVED** by the Board of Directors of NVTA that NVTA’s Conflict of Interest Code attached hereto as Exhibit A is hereby approved and shall be effective upon confirmation by the Napa County Board of Supervisors as code reviewing body for the Authority.

**THE FOREGOING RESOLUTION WAS DULY AND REGULARLY ADOPTED** by the Board of Directors of the Napa Valley Transportation Authority, at a regular meeting of the Board held on the 20<sup>th</sup> day of November 2024 by the following vote:

Ayes:

\_\_\_\_\_  
Mark Joseph, NVTA Chair

Nays:

Absent:

ATTEST:

\_\_\_\_\_  
Laura Sanderlin, NVTA Board Secretary

APPROVED:

\_\_\_\_\_  
Osman Mufti, NVTA Legal Counsel

**CERTIFICATIONS**

I hereby certify that I am the Secretary of the Napa Valley Transportation Authority and the custodian of the records for the Authority and that the attached Resolution is a true and correct copy of the original approved by the Board of Directors of the Authority and on file in the Authority office.

By \_\_\_\_\_  
LAURA.SANDERLIN  
NVTA Board Secretary

I hereby certify that the amended Conflict of Interest Code for the Napa Valley Transportation Authority was approved and confirmed by the Napa County Board of Supervisors, as code reviewing body for the District, by action of the Board of Supervisors on \_\_\_\_\_, 2024, recorded in the certified minutes of the Board of Supervisors for that date.

By \_\_\_\_\_  
Clerk of the Napa County Board of Supervisors

## EXHIBIT A

### NAPA VALLEY TRANSPORTATION AUTHORITY (NVTA)

#### CONFLICT OF INTEREST CODE

The Political Reform Act (Government Code Section 81000, et seq.) requires state and local government agencies to adopt and promulgate conflict of interest codes. The Fair Political Practices Commission has adopted a regulation (2 California Code of Regulations Section 18730) that contains the terms of a standard conflict of interest code, which can be incorporated by reference in an agency's code. After public notice and hearing, the standard code may be amended by the Fair Political Practices Commission to conform to amendments in the Political Reform Act. Therefore, the terms of 2 California Code of Regulations Section 18730 and any amendments to it duly adopted by the Fair Political Practices Commission are hereby incorporated by reference. This regulation and the attached Appendices, designating positions and establishing disclosure categories, shall constitute the conflict of interest code of the Napa Valley Transportation Authority (**NVTA** or **Authority**)

Individuals holding designated positions shall file their statements of economic interest with **NVTA**, which will make the statements available for public inspection and reproduction (Gov. Code § 81008). All statements will be retained by **NVTA**.

**APPENDIX “A”  
LIST OF DESIGNATED EMPLOYEES**

The following positions within the Authority may involve the making or participation in the making of decisions of the Authority which may foreseeably have a material effect on financial interests of the holders of the positions. Most of the positions listed are of long-term duration, although some are limited-term positions, but all are listed because their scope of authority or work involves either making final decisions for the Authority which have financial consequences or developing and/or exercising such a level of expertise and ongoing relationship with those who make such decisions that the decision-makers can reasonably be expected to routinely trust and rely upon their advice.

For purposes of filing Statements of Economic Interests as required by this Conflict of Interest Code, the “Designated Employees” of the Authority shall be those persons who actually occupy or carry out the functions of the following positions; whether as elected or appointed officers, compensated employees, or contracted consultants:

<b><u>DESIGNATED EMPLOYEE POSITIONS</u></b>	<b><u>DISCLOSURE CATEGORY</u></b>
<b>Members and Alternate Members of the Board of Directors</b>	<b>1</b>
<b>Executive Director</b>	<b>1</b>
<b>Deputy Executive Director</b>	<b>1</b>
<b>Director, Administration, Finance, and Policy</b>	<b>1</b>
<b>Board Secretary/Human Resources</b>	<b>2</b>
<b>Program Manager - Engineering -</b>	<b>2</b>
<b>Program Manager - Public Transit</b>	<b>2</b>
<b>Authority Legal Counsel</b>	<b>1</b>
<b>Authority Auditor-Controller</b>	<b>1</b>
<b>Authority Treasurer</b>	<b>1</b>

**Contract Consultants for the Authority.** Contract consultants shall be included in the list of Designated Employees and shall disclose their material financial interests in regard to all of the adopted disclosure categories, subject to the following limitation:

The Executive Director may determine in writing that a particular contract consultant, although a “designated position”, is hired to perform a range of duties that is limited in



scope and thus is not required to comply or fully comply with all of the disclosure requirements described in Appendix "B". This written determination shall include a description of the contract consultant's duties and, based upon that description, a statement of the extent of disclosure requirements. This determination is a public record and shall be retained for public inspection and be available for inspection and copying in the same location and manner as the Authority's copy of the Conflict of Interest Code.

#### **PUBLIC OFFICIALS OF THE DISTRICT WHO MANAGE PUBLIC INVESTMENTS**

It has been determined that the Authority Treasurer (the Napa County Treasurer-Tax Collector serving ex-officio) manages public investments and therefore shall file a Statement of Economic Interests pursuant to Government Code section 87200.

**APPENDIX “B”  
DISCLOSURE CATEGORIES**

The disclosure categories listed below identify the types of investments, business positions, course of income, or real property, which the designated employee must disclose for each disclosure category to which he or she is assigned.

**DISCLOSURE CATEGORIES**

**CATEGORY 1.** Persons in this category shall disclose all investments, business positions in business entities, sources of income, including receipt of gifts, loans, and travel payments and interests in real property.

**CATEGORY 2.** Persons in this category shall disclose investments, business positions and income, including gifts, loans and travel payments, from sources that provides, or contracts with the Authority or its Purchasing Agent to provide, or may foreseeably provide, goods, services, supplies, materials, machinery or equipment to the Authority, or has contracted with the Authority or its Purchasing Agent to supply goods, services, supplies, materials, machinery or equipment, including contracts with the Authority to receive grants from or through the Authority. Persons in this category shall also disclose all interests in real property.

**RESOLUTION NO. 22-2824-16**

**A RESOLUTION OF THE  
NAPA VALLEY TRANSPORTATION AUTHORITY (NVTA)  
AMENDING THE AGENCY CONFLICT OF INTEREST CODE**

**WHEREAS**, on September 21, 1993, the Napa County Board of Supervisors, acting as the code reviewing body, approved the adoption of a Conflict of Interest Code for the Napa County Congestion Management Agency, as required by the Political Reform Act of 1974 (Government code sections 81000 et seq., hereinafter referred to as “Act”); and

**WHEREAS**, on or about May 13, 1998, the Napa County Congestion Management Agency was converted into and succeeded by the Napa County Transportation and Planning Agency (“NCTPA”), a joint powers agency organized under the Joint Exercise of Powers Act (Government Code section 6500 et seq.); and

**WHEREAS**, on September 18, 2002, the Board amended the NCTPA Conflict of Interest Code, to conform to changes made in the model conflict of interest code (“model code”) promulgated by the Fair Political Practices Commission (“FPPC”) and expand the list of designated positions and disclosure categories to reflect the current operations of the NCTPA in serving as the countywide transportation planning body for the incorporated and unincorporated areas within Napa County, and performing such transportation related duties and responsibilities as the Member Jurisdictions may delegate to NCTPA; and

**WHEREAS**, on November 14, 2012, the Board of NCTPA amended its Conflict of Interest Code in its entirety; and

**WHEREAS**, on November 19, 2014, the Board of NCTPA amended Appendix A of the Conflict of Interest Code in its entirety; and

**WHEREAS**, on February 17, 2016 the Board of the NCTPA approved Resolution No. 16-02 changing the name of the NCTPA to the Napa Valley Transportation Authority (NVTA or Authority), a Joint Powers Authority; and

**WHEREAS**, on June 15, 2016 the Board of NVTA amended its Conflict of Interest Code in its entirety; and

**WHEREAS**, on October 23, 2019 the Board of NVTA amended its Conflict of Interest Code in its entirety; and

**WHEREAS, on October 19, 2022 the Board of NVTA amended its Conflict of Interest Code in its entirety; and**

**WHEREAS**, it is now necessary to amend the Conflict of Interest Code in its entirety to reflect added and deleted management positions, and/or changes in management titles; and

**WHEREAS**, the Napa County Board of Supervisors, acting as the code reviewing body, will consider approval of this Resolution later in 2024~~2~~.

**THEREFORE, BE IT RESOLVED** by the Board of Directors of NVTA that NVTA’s Conflict of Interest Code attached hereto as Exhibit A is hereby approved and shall be effective upon confirmation by the Napa County Board of Supervisors as code reviewing body for the Authority.

**THE FOREGOING RESOLUTION WAS DULY AND REGULARLY ADOPTED** by the Board of Directors of the Napa Valley Transportation Authority, at a regular meeting of the Board held on the 2019<sup>th</sup> day of ~~October 2022~~November 2024 by the following vote:

Ayes:

Liz AlessioMark Joseph, NVTA Chair

Nays:

Absent:

ATTEST:

Laura Sanderlin, NVTA Board Secretary

APPROVED:

Osman Mufti, NVTA Legal Counsel

**CERTIFICATIONS**

I hereby certify that I am the Secretary of the Napa Valley Transportation Authority and the custodian of the records for the Authority and that the attached Resolution is a true and correct copy of the original approved by the Board of Directors of the Authority and on file in the Authority office.

By \_\_\_\_\_  
LAURA.SANDERLIN  
NVTA Board Secretary

I hereby certify that the amended Conflict of Interest Code for the Napa Valley Transportation Authority was approved and confirmed by the Napa County Board of Supervisors, as code reviewing body for the District, by action of the Board of Supervisors on \_\_\_\_\_, 20242, recorded in the certified minutes of the Board of Supervisors for that date.

By \_\_\_\_\_  
Clerk of the Napa County Board of Supervisors

**EXHIBIT A****NAPA VALLEY TRANSPORTATION AUTHORITY (NVTA)****CONFLICT OF INTEREST CODE**

The Political Reform Act (Government Code Section 81000, et seq.) requires state and local government agencies to adopt and promulgate conflict of interest codes. The Fair Political Practices Commission has adopted a regulation (2 California Code of Regulations Section 18730) that contains the terms of a standard conflict of interest code, which can be incorporated by reference in an agency's code. After public notice and hearing, the standard code may be amended by the Fair Political Practices Commission to conform to amendments in the Political Reform Act. Therefore, the terms of 2 California Code of Regulations Section 18730 and any amendments to it duly adopted by the Fair Political Practices Commission are hereby incorporated by reference. This regulation and the attached Appendices, designating positions and establishing disclosure categories, shall constitute the conflict of interest code of the Napa Valley Transportation Authority (**NVTA** or **Authority**)

Individuals holding designated positions shall file their statements of economic interest with **NVTA**, which will make the statements available for public inspection and reproduction (Gov. Code § 81008). All statements will be retained by **NVTA**.

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For purposes of filing Statements of Economic Interests as required by this Conflict of Interest Code, the “Designated Employees” of the Authority shall be those persons who actually occupy or carry out the functions of the following positions; whether as elected or appointed officers, compensated employees, or contracted consultants:

<u>DESIGNATED EMPLOYEE POSITIONS</u>	<u>DISCLOSURE CATEGORY</u>
<b>Members and Alternate Members of the Board of Directors</b>	<b>1</b>
<b>Executive Director</b>	<b>1</b>
<b><u>Deputy Executive Director</u></b>	<b><u>1</u></b>
<b>Director, Administration, Finance, and Policy</b>	<b>1</b>
<b><del>Director, Capital Development and Planning</del></b>	<b><del>2</del></b>
<b><del>Office Manager / Board Secretary / <u>Human Resources</u></del></b>	<b><del>2</del></b>
<b>Program Manager - Engineering -</b>	<b><u>2</u></b>
<b>Program Manager - Public Transit</b>	<b>2</b>
<b>Authority Legal Counsel</b>	<b>1</b>
<b>Authority Auditor-Controller</b>	<b>1</b>
<b>Authority Treasurer</b>	<b>1</b>

**Contract Consultants for the Authority.** Contract consultants shall be included in the list of Designated Employees and shall disclose their material financial interests in regard to all of the adopted disclosure categories, subject to the following limitation:

The Executive Director may determine in writing that a particular contract consultant, although a “designated position”, is hired to perform a range of duties that is limited in scope and thus is not required to comply or fully comply with all of the disclosure requirements described in Appendix “B”. This written determination shall include a description of the contract consultant’s duties and, based upon that description, a statement of the extent of disclosure requirements. This determination is a public record and shall be retained for public inspection and be available for inspection and copying in the same location and manner as the Authority's copy of the Conflict of Interest Code.

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DISCLOSURE CATEGORIES**

The disclosure categories listed below identify the types of investments, business positions, course of income, or real property, which the designated employee must disclose for each disclosure category to which he or she is assigned.

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**CATEGORY 2.** Persons in this category shall disclose investments, business positions and income, including gifts, loans and travel payments, from sources that provides, or contracts with the Authority or its Purchasing Agent to provide, or may foreseeably provide, goods, services, supplies, materials, machinery or equipment to the Authority, or has contracted with the Authority or its Purchasing Agent to supply goods, services, supplies, materials, machinery or equipment, including contracts with the Authority to receive grants from or through the Authority. Persons in this category shall also disclose all interests in real property.



## NAPA VALLEY TRANSPORTATION AUTHORITY COVER MEMO

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### **SUBJECT**

Contract Amendment with Kleinfelder for Construction Services

### **STAFF RECOMMENDATION**

That the Napa Valley Transportation Authority (NVTA) Board authorize the Executive Director to execute and make minor modifications to Amendment #3 to Agreement 21-20-CM01 for construction management and material testing services with Kleinfelder Construction Services, increasing the contract value by \$46,276 for an amount not to exceed \$1,945,102.

### **EXECUTIVE SUMMARY**

NVTA is administering the construction of a photovoltaic (PV) system at the Vine Transit Maintenance Facility through a design-build-operate contract with 127 Energy, with expected completion in January 2025. Kleinfelder Construction Services (KCS), initially contracted to manage and inspect the Bus Maintenance Facility construction contract, was later authorized to extend these services to the PV system project using anticipated savings from the original contract. However, due to extended closeout needs for the Bus Maintenance Facility, these savings were expended. To ensure continued oversight of PV construction, staff recommends Board approval of an additional \$46,276 contract amendment with KCS, bringing the total contract value to \$1,945,102.

### **FISCAL IMPACT**

Yes. Up to \$46,276. Transportation Development Act funds will be used to pay for these services.



## NAPA VALLEY TRANSPORTATION AUTHORITY

### Board Agenda Memo

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**TO:** NVTA Board of Directors  
**FROM:** Kate Miller, Executive Director  
**REPORT BY:** Grant Bailey, Program Manager – Engineer  
(707) 259-5951 / Email: [gbailey@nvta.ca.gov](mailto:gbailey@nvta.ca.gov)  
**SUBJECT:** Contract Amendment with Kleinfelder for Construction Services

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#### **RECOMMENDATION**

That the Napa Valley Transportation Authority (NVTA) Board authorize the Executive Director to execute and make minor modifications to Amendment No. 3 to Agreement 21-20-CM01 for construction management and material testing services with Kleinfelder Construction Services, increasing the contract value by \$46,276 for an amount not to exceed \$1,945,102.

#### **COMMITTEE RECOMMENDATION**

None

#### **BACKGROUND**

NVTA has contracted with 127 Energy under a design-build-operate project delivery model to construct and operate a photovoltaic (PV) system consisting of shade structures and roof mounted panels at NVTA's new Vine Transit Maintenance Facility. PV system construction began in August 2024 and is scheduled to conclude by the end of January 2025.

Kleinfelder Construction Services (KCS) performed construction management and inspection (CM/I) services for the Bus Maintenance Facility contract. In March 2024, the Board approved a contract amendment with KCS, authorizing additional scope and fee for CM/I services associated with the PV System contract. This amendment was partially funded by original Bus Maintenance Facility CM/I scope funds that were anticipated to go unused. However, closeout activities for the Bus Maintenance Facility have gone on longer than expected which resulted in a drawdown of the expected savings, leading to a budgetary need for PV system construction oversight. To ensure proper construction

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management and inspection oversight of the PV system construction, staff is recommending the Board approval contract amendment with KCS, increasing the contract value by \$46,276 for an amount not to exceed \$1,945,102.

### **ALTERNATIVES**

The Board could decide not to approve this amendment and transition construction management and inspection duties to NVTA staff which will limit the agency's ability to effectively manage and deliver other ongoing projects. Materials testing scope cannot be transitioned to NVTA staff as testing and inspection are highly specialized. This option would likely halt construction of the PV system since materials inspections are required for intermediate construction permit approvals.

### **STRATEGIC GOALS MET BY THIS PROPOSAL**

Goal 5: Minimize the energy and other resources required to move people and goods.

The construction of the Bus Maintenance Facility and PV system will result in system efficiencies and reduction in power costs.

Goal 3: Use taxpayer dollars efficiently.

Hiring short-term consultants with expertise in a variety of fields is more economically viable than hiring full time employees with the qualifications needed to manage the construction of these capital projects.

### **ATTACHMENTS**

(1) Amendment No. 3 Construction Management and Materials Testing and Inspection Services Agreement No. 21-20-CM01 – Kleinfelder Construction Services Inc.

**PROJECT WORK ORDER NO. 21-20-CM01  
ON-CALL CONSTRUCTION MANAGEMENT  
BIOLOGIST/ARCHEOLOGIST & MATERIAL TESTING  
SERVICES**

**PROJECT NAME:** BUS MAINTENANCE FACILITY – CONSTRUCTION MANAGEMENT AND INSPECTION SERVICES FOR PHOTOVOLTAIC (PV) SYSTEM

**PROJECT MANAGER:** Grant Bailey, PE, Program Manager – Engineer  
[gbailey@nvta.ca.gov](mailto:gbailey@nvta.ca.gov) | 707.259.5951

**CONSULTANT DESIGNATED TEAM MEMBERS:**

- Kleinfelder Construction Services, Inc. – see fee schedule/cost proposal (EXHIBIT A)

Consultant will independently and at its own discretion and liability enter into agreement with sub-consultant(s) listed in their proposal for any services required to complete the project as described in the scope of work.

**SCOPE OF SERVICE:** Extend services to provide professional construction management, inspection, and materials testing services for the Bus Maintenance Facility – Sheehy Court, and materials testing services for construction of PV system.

- **WHEREAS NVTA REQUIRES ADDITIONAL SERVICES TO BE PERFORMED BY THE CONTRACTOR UNDER EXHIBIT A, EXTENDED CM SERVICES, ESTIMATE, BASELINE SCHEDULE AND PROGRESS SCHEDULE**
- **WHEREAS CONTRACTOR IS ABLE TO PROVIDE THE DESCRIBED SERVICES AT AN ADDITIONAL COST TO NVTA IN THE AMOUNT OF \$46,276 AS PER COST PROPOSAL ATTACHED IN EXHIBIT A, INCREASING THE TOTAL WORK ORDER NTE AMOUNT TO \$1,945,102; AND**
- **WHEREAS NVTA WILL NEED TO EXTEND THE TERM DATE TO JUNE 30, 2025, TO ACCOMMODATE ADDITIONAL SERVICE PERFORMANCE TO COMPLETE THE PROJECT.**
- **WITH THE EXCEPTION OF THE ABOVE ALL TERMS AND CONDITIONS AS AGREED TO IN THE PROJECT WORK ORDER REMAIN IN FULL FORCE AND EFFECT.**

**START DATE:** November 1, 2021                      **NEW COMPLETION DATE:** *June 30, 2025*

NOT-TO-EXCEED AMOUNT FOR THIS PROJECT: \$1,898,826 (A-2)

**NEW NOT-TO-EXCEED AMOUNT FOR THIS PROJECT: NTE \$1,945,102**

**FUNDING SOURCE/ACCOUNT CLASSIFICATION:** TDA  
*(For Internal Use Only)*

**TERMS AND CONDITIONS:** This Amendment No. 3 to Project Work Order is issued and entered into as of the last date written below in accordance with the terms and conditions set forth in the Master Agreement with CONTRACTOR dated *NOVEMBER 1, 2021*, which terms are hereby incorporated and made part of this Project Work Order.

NVTA

By: \_\_\_\_\_  
KATE MILLER, Executive Director                      Date

Approved as to Form	
By: _____	NVTA General Counsel
Date: _____	

CONTRACTOR  
Kleinfelder Construction Services, Inc.

By: \_\_\_\_\_  
DAVID WATSON, President                      Date

# EXHIBIT A



**Date:** October 30, 2024,

**Napa Valley Transportation Authority (NVRTA)**

625 Burnell Street

Napa, CA 94559

**Attn:** Grant Bailey

**Subject:** Add Services Request (ASR) #01 Photo Voltaic (PV) System  
**Extended CM Services**

Dear Mr. Bailey,

This fee proposal requests “**Extended CM Services**” for Kleinfelder Construction Services (KCS) current contract with Napa Valley Transportation Authority (NVRTA) dated March 26, 2024. The need is associated with the Design Build Team schedule push from January 09, 2025, to January 30, 2025. The push is associated with MBC, the canopy contractor late start.

**Exhibit “A”** illustrates the total requested “**Extended CM Services**” fee for ASR #01. The fee extends through February 28, 2025, for the following specific reasons.

1. The “Final Completion” date has pushed 21 calendar days or 15 working days.
2. Provide a 2week buffer for potential schedule push associated with the canopy structures C1.
3. Provide 2weeks for closeout and issuance of a “Notice of Completion” to the Design Build Team.

**Exhibit “B”** provides the “**Baseline Schedule**” DD July 19, 2024, and the “**Progress Schedule**” DD September 9, 2024, that illustrates the “Final Completion” activity push to January 09, 2025, to January 30, 2025. Reference Activity ID #8 on the “Baseline Schedule” and Activity ID #32 compared to the Activity #7 on the “Progress Schedule” and Activity ID #33 to illustrate MBC schedule push.

KCS has itemized the requested fee for ASR #01 to cover our extended CM services to the adjusted ‘Final Completion’ date of the project. The total requested fee is \$46,275.96. Our services will extend through February 28, 2025, for the reasons stated above and illustrated in Exhibit “A”. Kleinfelder invoices on a time & material basis against our fee estimates. Any unused approved fee will be left for NVRTA to reallocate accordingly. If NVRTA have questions, please feel free to contact me at your earliest opportunity.

Regards,

*Thomas J Fakner*

Thomas J Fakner, CCM  
Project Director

## EXHIBIT "A"

Kleinfelder Construction Services (KCS) Construction Management

### ADDITIONAL SERVICES REQUEST #01

Materials Testing, Inspections and Special Inspections, and Administartion Services for Napa Valley Transportation Authority (NVTA) PV System Design Build capital project.

ID #	SERVICE DESCRIPTION	UNIT	FEE
01	Executed Contract Base Fee CM Services	LS	\$226,317.00
02	Extended CM Services from January 09, 2025, to February 28, 2025,	LS	\$42,069.05
03	Sub Total		\$268,386.05
04	Contingency 10% of ID #02		\$4,206.91
05	<b>TOTAL FEE</b>		<b>\$272,592.96</b>

## Utilization Forecasting

Employee Workplan - projections				21-20 - NVTA -Napa Valley Transportation Authority On-Call				04 - PV System				Total
				Nov 24	Dec 24	Jan 25	Feb 25					
				Projections	Projections	Projections	Projections					
Kleinfelder	TBD, TBD	Field Materials Tech	Hours	1 hrs	1 hrs	1 hrs	1 hrs					4 hrs
			Cost	\$0	\$0	\$0	\$0					\$0
			Lab Tests	\$5,991	\$5,991	\$5,991	\$5,991					\$23,963
<b>Firm Total</b>				<b>\$5,991</b>	<b>\$5,991</b>	<b>\$5,991</b>	<b>\$5,991</b>					<b>\$23,963</b>
Kleinfelder - Construction Services	Amamreh, Jamil		Hours	121 hrs	96 hrs	96 hrs	40 hrs					353 hrs
			Cost	\$164.00	\$19,844	\$15,744	\$15,744					\$57,892
	Beringhaus, Michalle	Project Controls Analyst	Hours	2 hrs	2 hrs	2 hrs	2 hrs					8 hrs
			Cost	\$177.00	\$354	\$354	\$354					\$1,416
	Bohannon, Ken	Program Manager	Hours	4 hrs	4 hrs	4 hrs	4 hrs					16 hrs
			Cost	\$285.00	\$1,140	\$1,140	\$1,140					\$4,560
	Fakner, Thomas	Construction Inspector	Hours	30 hrs	30 hrs	30 hrs	16 hrs					106 hrs
			Cost	\$250.00	\$7,500	\$7,500	\$7,500					\$30,000
			Truck-Month		\$250	\$250	\$250					\$1,001
	Pollock, John	Inspector	Hours	80 hrs	80 hrs	40 hrs	20 hrs					220 hrs
			Cost	\$164.00	\$13,120	\$13,120	\$6,560					\$36,080
			Truck-Month		\$668	\$668	\$668					\$2,671
	Wilson, Taylor	Project Controls Associate	Hours	2 hrs	2 hrs	2 hrs	2 hrs					8 hrs
			Cost	\$107.00	\$214	\$214	\$214					\$856
<b>Firm Total</b>				<b>\$43,090</b>	<b>\$38,990</b>	<b>\$32,430</b>	<b>\$19,966</b>					<b>\$134,476</b>
Contract Total			Hours	240 hrs	215 hrs	175 hrs	85 hrs					715 hrs
			Cost	\$42,172	\$38,072	\$31,512	\$19,048					\$130,804
			Truck-Month	\$918	\$918	\$918	\$918					\$3,672
			Lab Tests	\$5,991	\$5,991	\$5,991	\$5,991					\$23,963
<b>Contract Total</b>				<b>\$49,081</b>	<b>\$44,981</b>	<b>\$38,421</b>	<b>\$25,957</b>					<b>\$158,439</b>
Authorized Budget			\$262,262.00									
Revised Authorized Budget (including TO01 under-run)			\$296,992.18									
Projected Actuals through October 2024			\$180,621.95									
Projected			\$158,439.28									
EAC			\$339,061.23									
Over / Under			(\$42,069.05)									

## **EXHIBIT “B”**

*Kleinfelder Construction Services (KCS) Construction Management*

### **“Baseline Schedule” DD July 19, 2024**

The Design Build Team schedule Activity ID #08 under “Procurement” work breakdown category (WBS) shows a “Start to Finish” from July 29, 2024, through September 6, 2024.

Schedule Activity ID #31 shows a “Canopy Solar” sub work category “Start to Finish” from September 18, 2024, to November 19, 2024. This activity consists of Activity ID #32 “Canopy Construction” and Activity ID #54 “Canopy Electrical”. The canopy solar activity duration is 45 days

For illustrative purposes reference the attached project schedules.

### **“Progress Schedule” DD September 09, 2024**

The Design Build Team schedule Activity ID #07 under procurement shows a “Start to Finish” from August 19, 2024, through October 14, 2024.

Schedule Activity ID #33 shows a “Canopy Solar” subcategory as a construction activity “Start to Finish” from October 14, 2024, to November 12, 2024, with a duration of 22 days. The “Canopy Electrical” is not a part of the “Canopy Solar”. It is a separate subcategory as a construction activity. It is defined as ID #68 with a duration of 56 days. The combined total duration is 78 days.

For illustrative purposes reference the attached project schedules.



# Napa Valley Transportation Authority

625 Burnell Street  
Napa, CA 94559

## Meeting Minutes NVTA Board of Directors

Wednesday, October 16, 2024

1:00 PM

JoAnn Busenbark Board Room

### 1. Call to Order

Chair Joseph called the meeting to order at 1:01pm.

### 2. Pledge of Allegiance

Chair Joseph recited the Pledge of Allegiance.

### 3. Approval of Board Member Remote Participation

None

### 4. Roll Call

Alfredo Pedroza  
Paul Dohring  
Mark Joseph  
Liz Alessio  
Scott Sedgley  
Donald Williams  
Kevin Eisenberg  
Ryan Gregory  
Robin McKee-Cant  
**Non Voting:**  
Devereaux Smith  
**Absent:**  
Leon Garcia  
Margie Mohler  
Anna Chouteau

### 5. Adoption of the Agenda

**Motion MOVED by ALESSIO, SECONDED by DOHRING to APPROVE Item 5 Adoption of the Agenda. Motion passed unanimously.**

**Aye:** 18 - Dohring, Joseph, Alessio, Sedgley, Williams, Eisenberg, Gregory, and McKee-Cant

**Absent:** 6 - Garcia, Pedroza, Mohler, and Chouteau

### 6. Public Comment

None

{Director Pedroza entered the meeting at this time}

## 7. Chairperson's, Board Members', Metropolitan Transportation Commissioner's, and Association of Bay Area Governments Update

Director Pedroza reported recent MTC activities.

## 8. Executive Director's Update

Executive Director Miller reported:

- Staffing updates
- Deputy Executive Director Schmitz appointment to the CA Transit Association Federal Legislative Committee
- Attendance and topics discussed at CA Transit Association Federal Lobby trip in Washington
- TAC Retreat recap
- Oct 9th Walk and Roll to School sponsorship
- tabling at upcoming St. Helena Harvest festival
- committee member recruitment efforts
- Measure U endorsements

## 9. Caltrans' Update

Caltrans updates presented by Anthony Cabangangan.

## 10. CONSENT AGENDA ITEMS

Motion **MOVED** by DOHRING, **SECONDED** by ALESSIO to **APPROVE** Item 10 Consent Agenda 10.1-10.9. Motion passed unanimously.

**Aye:** 20 - Pedroza, Dohring, Joseph, Alessio, Sedgley, Williams, Eisenberg, Gregory, and McKee-Cant

**Absent:** 4 - Garcia, Mohler, and Chouteau

### 10.1 Meeting Minutes of September 18, 2024 (Laura Sanderlin) (Pages 11-16)

Attachments: [Draft Minutes](#)

### 10.2 Disposal of Non-Performing Assets (Antonio Onorato) (Pages 17-23)

Attachments: [Staff Report](#)

### 10.7 Purchase Order 24-P4028 to Purchase Electric Vehicle Charging Stations from Contractor's Electrical Distributors (CED) for Future Zero Emission Buses (Rebecca Schenck) (Pages 49-73)

Attachments: [Staff Report](#)

### 10.3 Paratransit Coordinating Council (PCC) Member Appointment to the Napa Valley Transportation Authority Technical Advisory Committee (TAC) (Kathy Alexander) (Pages 24-26)

Attachments: [Staff Report](#)

- 10.4 Notice of Completion for the Napa Valley Vine Trail St. Helena to Calistoga Project (Grant Bailey) (Pages 27-32)  
**Attachments:** [Staff Report](#)
- 10.5 Notice of Completion for the James Diemer Drive Bus Stop Improvement Project (Grant Bailey) (Pages 33-28)  
**Attachments:** [Staff Report](#)
- 10.6 Fund Transfer Agreement with the State of California Department of Transportation (Caltrans) for the Fiscal Year (FY) 2024-25 State Transportation Improvement Program (STIP) Planning, Programming and Monitoring (PPM) Program (Antonio Onorato) (Pages 39-48)  
**Attachments:** [Staff Report](#)
- 10.8 Agreement No. 24-OCE12-E06 with TYLin for Engineering Design Services for the Electric Vehicle Chargers at the Vine Bus Maintenance Facility (Grant Bailey) (Pages 74-81)  
**Attachments:** [Staff Report](#)
- 10.9 Paratransit Coordinating Council (PCC) Member Appointment (Kathy Alexander) (Pages 82-88)  
**Attachments:** [Staff Report](#)

## **11. PRESENTATIONS**

### **11.1 NVTa Project Update (Grant Bailey)**

**Information only/No action taken**

**Updates reported for the following projects:**

- Sosc0 Gateway Transit Center building modifications
- Imola Park and Ride
- Napa Valley College Bus Stop
- Sosc0 Junction
- Vine Trail St. Helena to Calistoga Segment
- SR29/12 Airport Interchange
- SR 29 American Canyon Corridor

### **11.2 Countywide Active Transportation Plan (Patrick Band)**

**Information only/No action taken**

**Colin Burgett, Holly Murphy and Todd Tregenza of GHD participated in presentation.**

### **11.3 2025 State Legislative Update (Steve Wallauch, Platinum Advisors)**

**Information only/No action taken**

### **11.4 2025 Federal Legislative Update (Jessica Aune & Tony Hobbs, Platinum Advisors)**

Information only/No action taken

## **12. REGULAR AGENDA ITEMS**

- 12.1** 2025 Federal and State Legislative Advocacy Program and Project Priorities and Federal and State Legislative Update (Danielle Schmitz) (Pages 89-125)

**Attachments:** [Staff Report](#)

**Motion MOVED by ALESSIO, SECONDED by DOHRING to APPROVE ITEM 12.1 Legislative Advocacy Program for 2025. Motion passed unanimously.**

**Aye:** 20 - Pedroza, Dohring, Joseph, Alessio, Sedgley, Williams, Eisenberg, Gregory, and McKee-Cant

**Absent:** 4 - Garcia, Mohler, and Chouteau

- 12.2** Vine Transit Update (Rebecca Schenck) (Pages 126-133)

**Attachments:** [Staff Report](#)

Information only/No action taken

Public comment by Yountville resident, Alan Tenscher promoting the need for reliable and real time transit communication for fixed routes.

- 12.3** Free Transit and Fare Subsidy Programs (Kate Miller) (Pages 134-139)

**Attachments:** [Staff Report](#)

Information only/No action taken

The Board delved into discussion about revenue sources, expenditures, and various pilot program opportunities to increase ridership.

{Director Sedgley departed meeting 3:28pm}

## **13. CLOSED SESSION**

The Board entered into Closed Session at 3:29pm.

- 13.1** CONFERENCE WITH LEGAL COUNSEL - ANTICIPATED LITIGATION:  
Initiation of Litigation pursuant to Government Code Section 54956.9(d)(4) (1 potential case)

{Director Gregory departed 3:42pm and Director Dohring departed 4:07pm}

Returned from Closed Session at 4:09pm with no reportable action.

- 13.2** PUBLIC EMPLOYMENT  
(Pursuant to Government Code Section 54957(b)(1)  
Title: Executive Director  
Closed Session Item 13.2 was continued.

**13.3** CONFERENCE WITH REAL PROPERTY NEGOTIATORS (pursuant to Government Code section 54956.8)  
Property APN: 006-195-001, 002 and 003  
Agency Negotiator: Executive Director  
Negotiating Parties: Paul Irwin, Stan Foltz, Bob Winchell, Walt Blackmon  
Under Negotiation: Price and terms of payment  
**Closed Session Item 13.3 was continued.**

**14. FUTURE AGENDA ITEMS**

**15. ADJOURNMENT**

Chair Joseph adjourned the meeting at 4:09pm.

**15.1 The next Regular Meeting is Wednesday, November 20th.**

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Laura M. Sanderlin, NVTA Board Secretary



## NAPA VALLEY TRANSPORTATION AUTHORITY COVER MEMO

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### **SUBJECT**

Construction Contract Award for the Soscol Gateway Transit Center Tenant Improvements Project

### **STAFF RECOMMENDATION**

That the Napa Valley Transportation Authority (NVTA) Board

1. Award Construction Contract No. 24-C40 to Carr's Construction Service, Inc. of Santa Rosa, CA in an amount not to exceed \$724,000;
2. Authorize the Executive Director to enter into and make minor modifications to Construction Agreement No. 24-C40 with Carr's Construction Service, Inc. for the construction phase of the Soscol Gateway Transit Center Tenant Improvements project (Project); and
3. Approve a fifteen percent (15%) construction contingency in an amount not to exceed \$108,600 for change orders.

### **EXECUTIVE SUMMARY**

The Soscol Gateway Transit Center (SGTC) requires updates to accommodate the agency's growth and changes in work culture. In March 2022, the Board approved a contract with Moniz Architecture for improvements, including new offices, a meeting space, and expanded facilities on the first floor, as well as sound attenuation on the second floor. Design was completed in July 2024, with an estimated cost of \$833,000. NVTA received three bids. One bid was deemed non-responsive. After verifying all requirements, staff recommends awarding the contract to Carr's Construction Service, Inc., the lowest responsive bidder, with a bid of \$724,000, along with a \$108,600 contract contingency, for a total authorized amount of \$832,600.

### **FISCAL IMPACT**

Yes, the construction contract bid amount is \$724,000 plus a not to exceed construction contingency amount of \$108,600. The total budget for the construction phase of the project is \$832,600. This project will be funded by Transportation Development Act funds.



## NAPA VALLEY TRANSPORTATION AUTHORITY

### Board Agenda Memo

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**TO:** NVTA Board of Directors  
**FROM:** Kate Miller, Executive Director  
**REPORT BY:** Grant Bailey, Program Manager - Engineer  
(707) 259-5951 / Email: [gbailey@nvta.ca.gov](mailto:gbailey@nvta.ca.gov)  
**SUBJECT:** Construction Contract Award for the Soscol Gateway Transit Center  
Tenant Improvements Project

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#### **RECOMMENDATION**

That the Napa Valley Transportation Authority (NVTA) Board

1. Award Construction Contract No. 24-C40 to Carr's Construction Service, Inc. of Santa Rosa, CA in an amount not to exceed \$724,000;
2. Authorize the Executive Director to enter into and make minor modifications to Construction Agreement No. 24-C40 with Carr's Construction Service, Inc. for the construction phase of the Soscol Gateway Transit Center Tenant Improvements project (Project); and
3. Approve a fifteen percent (15%) construction contingency in an amount not to exceed \$108,600 for change orders.

#### **COMMITTEE RECOMMENDATION**

None

#### **BACKGROUND**

When the Soscol Gateway Transit Center (SGTC) was first constructed, several areas, including the first floor, remained undeveloped. As the agency has grown and taken on new responsibilities and projects, the need for modifications to the SGTC has become apparent, particularly in light of changes to the work requirements following the pandemic.

In March 2023, the Board approved a design contract with Moniz Architecture design building improvements, which include:

**First Floor:** Two offices, a meeting space, wellness room, restroom with toilet, shower, and changing area as well as an expansion of the bus driver break room.

**Second Floor:** Sound attenuation treatments in the open cubicle areas and new pod meeting room.

Design of this project completed in July 2024 with an engineers estimate of \$833,000. An invitation for bids was released on August 28, 2024, with a bid deadline of October 15, 2024. Three (3) bids were received, with one bid deemed non-responsive at bid opening. The bid amounts are summarized in Table 1, below.

**Table 1: Bid Amounts**

<b>Company</b>	<b>Total</b>	<b>Percent of Engineers Estimate</b>
Carr's Construction Service, Inc.	\$724,000	13.1% Below
FRC, Inc.	\$877,000	5.3% Above
CWS Construction Group, Inc.	Rejected	Rejected

The two responsive bids were verified for bonds, current licenses, and Department of Industrial Relations registrations. Staff has determined that Carr's Construction Service, Inc. is the lowest responsible bidder and recommends that the Board award the contract to them.

### **ALTERNATIVES**

Alternative 1: The Board could decide not to award the contract to Carr's Construction Service, Inc., reject all bids and rebid the Project.

### **STRATEGIC GOALS MET BY THIS PROPOSAL**

The proposed action meets following goals:

Goal 1 - Serve the transportation needs of the entire community regardless of age, income, or ability. The project will accommodate new spaces to address additional work responsibilities, and additional needs associated with changing work requirements.

### **ATTACHMENT**

- (1) Draft Construction Agreement No. 24-C40



**CONSTRUCTION CONTRACT NO. 24-C40  
NVTA OFFICE TENANT IMPROVEMENTS**

**PROJECT NAME: NVTA OFFICE TENANT IMPROVEMENTS**

**PROJECT MANAGER:** Grant Bailey, Program Manager, Engineer -  
E [gbailey@nvta.ca.gov](mailto:gbailey@nvta.ca.gov) | T 707.259.5951

**CONSULTANT DESIGNATED TEAM MEMBERS:**

- Carr's Construction Service, Inc. Bid – EXHIBIT A
- List of Subcontractors – EXHIBIT B

*Contractor will independently and at its own discretion and liability enter into agreement with sub-contractor(s) listed in their bid for any services required to complete the project as described in the technical specifications.*

**SCOPE OF SERVICE:** Provide interior renovation work to existing office space on the first and second floor of the Soscol Gateway Transit Center (SGTC), as described in the Technical Specifications attached hereto as EXHIBIT C.

**START DATE:** Notice-to-Proceed (NTP)      **COMPLETION DATE:** 60 working days from NTP

**NOT-TO-EXCEED AMOUNT FOR THIS PROJECT:** \$724,000

**CHARGE NUMBER FOR PAYMENT:**          TDA3    

**TERMS AND CONDITIONS:** Incorporated in Construction Agreement No. 24-C40, and attached herein, ATTACHMENT 1.

**NVTA**

By: **UPON CONTRACT SIGNING**  
KATE MILLER, Executive Director

**CONTRACTOR**  
Carr's Construction Service, Inc.

By: **UPON CONTRACT SIGNING**  
CHRIS CARR  
Owner

Approved as to Form	
By:	_____
	NVTA General Counsel
Date:	_____

**CONSTRUCTION AGREEMENT**  
**NVTA No. 24-C40**

**THIS AGREEMENT**, dated for identification as of \_\_\_\_\_, 2024, is between the **NAPA VALLEY TRANSPORTATION AUTHORITY**, a California joint powers authority, hereinafter called "NVTA" or "Agency", and Carr's Construction Service, Inc., 3165 Calistoga Rd, Santa Rosa, CA 95404, hereinafter called "Contractor", and collectively referred to as "Parties".

The Parties hereto mutually agree to the terms and condition set forth herein.

**1. CONTRACT DOCUMENTS.**

a. The Contract Documents referred to herein are incorporated herein by reference as if set forth in full in this Agreement. Work called for in any one Contract Document and not mentioned in another is to be performed and executed as if mentioned in all Contract Documents.

b. The Contract Documents shall include the Notice Inviting Bids, Instructions to Bidders, Bid Forms (including the Bid, Bid Schedule(s), Information Required of Bidder, Bid Bond, and all required certificates, affidavits and other documentation), this Agreement, Performance Bond, Labor and Materials Bond, Maintenance Bond, General Conditions, any Supplementary General Conditions, Special Provisions, Specifications, Drawings, all Addenda, and Change Orders executed pursuant to the provisions of the Contract Documents. The General Conditions shall mean and refer to the current General Conditions of NVTA which are incorporated herein by this reference as if set forth herein.

c. This Agreement, and the Contract Documents, includes the exhibits to this Agreement, including Exhibit A Insurance, and Exhibit B Required Federal-Aid Contract Language (For Local Assistance Construction Projects) (Includes Form FHWA-1273 from Bid Documents), and Exhibit C Minimum Wage Rates (Federal and State Prevailing Wage Rates from Bid Documents.)

**2. AGREEMENT CONTROLS.** In the event of a conflict between the terms and conditions as set forth in this Agreement and the terms and conditions set forth in other Contract Documents, the terms and conditions set forth in this Agreement shall prevail. Unless otherwise specifically provided herein, all works and phrases defined in the General Conditions shall have the same meaning and intent in this Agreement.

**3. SCOPE OF CONTRACT.** Contractor agrees to furnish all tools, equipment, apparatus, facilities, labor and material and transportation necessary to perform and complete in a good and workman like manner to the satisfaction of NVTA, all the work called for, and in the manner designated in, and in strict conformity with the Project entitled:

Project Name : NAPA VALLEY TRANSPORTATION AUTHORITY  
OFFICE TENANT IMPROVEMENTS  
IFB No. : 24-R13  
Federal Project No. : N/A

**4. CONTRACT AMOUNT AND PAYMENTS.** NVTA agrees to pay, and Contractor agrees to accept, in full payment for the above work, Seven Hundred Twenty-Four Thousand DOLLARS (\$724,000) as the stipulated sum price which Contractor bid in its Bid Form, subject to additions and deductions by Change Order(s) as provided in the General Conditions.

**5. PROGRESS AND FINAL PAYMENTS.** Progress and final payments shall be in accordance with the General Conditions.

**6. RETENTION OF SUMS CHARGED AGAINST CONTRACTOR.** When, under the provisions of this Contract, NVTA is authorized to charge any sum of money against Contractor, NVTA may deduct and retain the amount of such charge from the amount of the next succeeding progress estimate, or from any other moneys due or that may become due to the Contractor from NVTA. If, on completion or termination of the Contract, sums due contractor are insufficient to pay NVTA's charges against Contractor, NVTA shall have the right to recover the balance from Contractor or his sureties.

**7. TIME OF COMPLETION.**

a. The entire work shall be completed to the satisfaction of NVTA within sixty (60) working days, commencing on the date of issuance of the Notice to Proceed.

b. Failure to complete the entire work by the completion date and in the manner provided for by the Contract Documents shall subject Contractor to liquidated damages as hereinafter provided in this Agreement. Time is of the essence in these Contract Documents.

**8. INSURANCE.** Contractor shall maintain in full force and effect at all times during the term of the Agreement, at its sole expense, policies of insurance in accordance with the General Conditions, including, but not limited to, Exhibit A, attached hereto and incorporated herein by reference.

**9. NO WAIVER OF REMEDIES.**

a. Neither the inspection by NVTA or its agents, nor any order or certificate for the payment of money, nor any payment for, nor acceptance of the whole or any part of the work by NVTA, nor any extensions of time, nor any position taken by NVTA or its agents shall operate as a waiver of any provision of this Agreement or of any power herein reserved to NVTA or any right to damages herein provided, nor shall any waiver of any breach of the Agreement be held to be a waiver of any other or subsequent breach.

b. All remedies provided in this Agreement shall be taken and construed as cumulative; that is, in addition to each and every other remedy herein provided, and NVTA shall have any and all equitable and legal remedies which it would in any case have.

**10. DETERMINATION OF DAMAGES.**

a. The actual fact of the occurrences of damages and the actual amount of the

damages which NVTA would suffer if the work were not completed within the specified times set forth are dependent upon many circumstances and conditions and, it is impracticable and extremely difficult to fix the actual damages. Damages which NVTA would suffer in the event of delay include loss of the use of the project, and, in addition, expenses of prolonged employment of an architectural and engineering staff; costs of administration, inspection, and supervision; and the loss suffered by the public within the County of Napa by reasons of the delay in the completion of the project to serve the public at the earliest possible time.

b. Accordingly, the parties hereto agree, and by execution of this Agreement, Contractor acknowledges that he understands, has ascertained and agrees, that the amounts set forth herein as liquidated damages shall be presumed to be that amount of damages sustained by the failure of Contractor to complete the entire work within the times specified.

#### **11. LIQUIDATED DAMAGES.**

a. The amount of the liquidated damages to be paid by Contractor to NVTA for failure to complete the entire work in the specified number of Working or Calendar Days (as extended, if applicable) will be **THREE HUNDRED DOLLARS(\$300)** for each **Calendar Day**, continuing to the time at which the work is completed.

b. Such amount is the actual cash value agreed upon as the loss to NVTA resulting from Contractor's delay.

#### **12. TERMINATION AFTER ALLOTTED WORKING OR CALENDAR DAYS.**

a. In addition to any rights it may have, NVTA may terminate this Contract at any time after the allotted number of Working or Calendar Days as adjusted by any extensions of time for excusable delays that may have been granted.

b. Upon such termination, Contractor shall not be entitled to receive any compensation for services rendered by him before or after such termination, and he shall be liable to NVTA for liquidated damages for all periods of time beyond such termination date until the work is completed.

#### **13. CONTRACTOR BANKRUPTCY.**

a. If Contractor should commence any proceeding under the Bankruptcy Act, or if Contractor be adjudged a bankrupt, or if Contractor should make any assignment for the benefit of creditors, or if a receiver should be appointed on account of Contractor's insolvency, then the NVTA Board may, without prejudice to any other right or remedy, terminate the Contract and complete the work by giving notice to Contractor and his surety according to the provisions of Section 1-15 of the General Conditions.

b. NVTA shall have the right to complete, or cause completion of the work, all as specified in the General Provisions of the Standard Specifications.

#### **14. PERFORMANCE AND PAYMENT BONDS.**

a. The Contractor shall, before beginning said work, file two bonds with NVTA, each

made payable to NVTA. These bonds shall be issued by a Surety Company authorized to do business in the State of California, and shall be maintained during the entire life of the Contract at the expense of the Contractor.

- (1) One bond shall be in the amount of one hundred percent (100%) of the Contract and shall guarantee the Faithful Performance of the Contract.
- (2) The second bond shall be the Payment Bond required by Part 4, Title 15, Chapter 7, Division Three of the Civil Code of the State of California and shall be in the amount of one hundred percent (100%) of the Contract.

b. Any alteration or alterations made in any provision of this Contract shall not operate to release any surety from liability on any bond required hereunder and the consent to make such alterations is hereby given, and any surety on said bonds hereby waives the provisions of Section 2819 of the Civil Code.

c. Bonds shall only be accepted from an “*Admitted Surety Insurer*”, which means an insurer to which the Insurance Commissioner has issued a certificate of authority to transact surety insurance in this state. **Contractor must submit** the original, or a certified copy, of the unrevoked appointment, power of attorney, bylaws or other instrument entitling or authorizing the person who executed the bond to do so.

- d. All bonds submitted shall include the following:
- Full name and address of the Contractor Surety, and NVTA;
  - Contract Date
  - Exact Contract Sum
  - Project Name and Address
  - Signature of the Contractor
  - Corporate Seal, if applicable
  - Signature of Authorized Surety Representative
  - Notarization of the Contractor and Surety
  - Power of Attorney
  - Local contact for surety, with name, phone number, and address to which legal notices may be sent

## 15. SUBSTITUTION OF SECURITIES OF MONEY WITHHELD.

a. At any time prior to final payment, Contractor may request substitution of securities for any money withheld by NVTA to ensure performance of the Contract.

b. At the expense of the Contractor, securities equivalent to the money withheld may be deposited with NVTA or with an approved financial institution as escrow agent according to a separate Security Agreement.

c. Securities eligible for substitution shall include those listed in Section 16430 of the Government Code or bank or savings and loan certificates of deposit. A fee set by NVTA’s Board shall be charged for such substitution.

**16. LABOR CODE COMPLIANCE.**

a. NVTA affirmatively identifies this project as a “public work” as that term is defined by Labor Code section 1720, and the project is, therefore, subject to prevailing wages under Labor Code section 1771.

b. Contractor and its subcontractors shall fully comply with all the provision of the California Labor Code governing the performance of public works contracts including, but not limited to, payment of prevailing wages, limitations on time worked, compliance with apprentice requirements, maintenance of payroll records, posting of wages at job site and prohibitions against discrimination.

**17. UNFAIR COMPETITION.** The following provision included in this agreement pursuant to California Public Contract Code §7103.5.

*"In entering into a public works contract or a subcontract to supply goods, services, or materials pursuant to a public works contract, the contractor or subcontractor offers and agrees to assigning to the awarding body all rights, title, and interest in and to all causes of action it may have under Section 4 of the Clayton Act (15 U.S.C. Sec. 15) or under the Cartwright Act (Chapter 2 (commencing with Section 16700) of Part 2 of Division 7 of the Business and Professions Code), arising from purchases of goods, services, or materials pursuant to the public works contract or the subcontract. This assignment shall be made and become effective at the time the awarding body tenders final payment to the contractor, without further acknowledgment by the parties."*

**18. GENERAL LIABILITY OF CONTRACTOR.** Unless otherwise provided in the Contract Documents, the Contractor shall provide and pay for all labor, materials, equipment, tools, construction equipment and machinery, water, light, heat, utilities, transportation and other facilities and services necessary for the execution and completion of the Work in accordance with the Contract Documents and any applicable code or statute, whether or not specifically described herein, as long as same is reasonably inferable therefrom as being necessary to produce the intended results, whether temporary or permanent, and whether or not incorporated or to be incorporated in the Work. The mention of any specific duty or liability of Contractor and, any reference to any specific duty or liability shall be construed to be for the purpose of explanation.

**19. AUTHORITY OF NVTA.**

a. NVTA will decide all questions regarding the quality and acceptability of materials furnished, work performed, and rate of progress of the Work. NVTA will decide all questions regarding the interpretation and fulfillment of the Contract on the part of the Contractor, and all questions as to the rights of different prime contractors involved with the Work. NVTA will determine the amount and quality of the Work performed and materials furnished for which payment is to be made under the Contract.

b. NVTA will administer its authority through a duly designated representative identified at the pre-construction conference. The Contractor and NVTA's designated representative (the Owner's Representative) shall make good faith attempts to resolve disputes that arise during the performance of the Work.

c. Any order given by NVTA not otherwise required by the Contract to be in writing shall be given or confirmed by NVTA in writing at the Contractor's request. Such request shall state the specific subject of the decision, order, instruction, or notice and, if it has been given orally, its date, time, place, author and recipient.

d. Any plan or method suggested to the Contractor by the ENGINEER, or any of the Owner's Representative, but not specified or required in writing, if adopted or followed in whole or in part by the Contractor, shall be used at the risk and responsibility of the Contractor. NVTA assumes no responsibility.

## **20. RESPONSIBILITY OF THE CONTRACTOR.**

a. The Work shall be under the Contractor's responsible care and charge until completion and final acceptance, and the Contractor shall bear the entire risk of injury, loss, or damage to any part by any cause. The Contractor shall rebuild, repair, restore, and make good all injuries, losses or damage to any portion of the Work or the materials occasioned by any cause, and shall bear the entire expense.

b. The mention herein of any specific duty or responsibility imposed upon the Contractor shall not be construed as a limitation or restriction of any other responsibility or duty imposed upon the Contractor by the Contract, said reference being made herein merely for the purpose of explaining the specific duty or responsibility.

c. The Contractor shall do all of the work and furnish all labor, materials, tools, equipment, and appliances, except as otherwise herein expressly stipulated, necessary or proper for performing and completing the Work herein required, including any change order work or disputed work directed by NVTA in conformity with the true meaning and intent of the Contract Documents, within the time specified.

## **21. INDEMNIFICATION.**

a. To the fullest extent permitted by law, the Contractor shall indemnify, defend with counsel acceptable to NVTA, and hold harmless NVTA, its officers, officials, employees, agents, and volunteers from and against any and all losses, claims, demands, damages, costs, expenses, attorney's fees, or liability of every nature arising out of or in any way connected with the performance or attempted performance of the provisions of this Contract, caused in whole or in part by any negligent or willful act or omission of the Contractor, its officers, employees, or agents, or anyone directly or indirectly acting on behalf of the Contractor, regardless of whether caused in part by a party indemnified hereunder. Nothing contained in the foregoing indemnity provisions shall be construed to require the Contractor to indemnify the indemnified party in contravention of Section 2782 of the Civil Code for the active or sole negligence or willful misconduct of that indemnified party.

b. To the fullest extent permitted by law, the Contractor's duty to defend shall extend, without limitation, to any suit or action founded upon any losses, claims, demands, damages, costs, expenses, attorney's fees, or liability of every nature arising out of or in any way connected with the performance or attempted performance of the provisions hereof, or in any way arising out of or connected with this Contract.

c. The defense and indemnity obligations expressly extend to and include any and

all claims, demands, damages, costs, expenses, or liability occasioned as a result of damages to adjacent property caused by the conduct of the Work.

d. The defense and indemnity obligations expressly extend to and include any and all claims, demands, damages, costs, expenses, or liability occasioned as a result of the violation by the Contractor, the Contractor's agents, employees, or independent contractors, Subcontractors or suppliers of any provisions of federal, State or local law, including applicable administrative regulations.

e. The defense and indemnity obligations also expressly extend to and include any claims, demands, damages, costs, expenses, or liability occasioned by injury to or death of any person, or any property damage to property owned by any person while on or about the site or as a result of the Work, whether such persons are on or about the site by right or not, whenever the Work is alleged to have been a contributing cause in any degree whatsoever.

f. In claims against any person or entity herein indemnified that are made by an employee of the Contractor or an employee of any of the Contractor's agents, independent contractors, Subcontractors or suppliers, a person indirectly employed by the Contractor or by any of the Contractor's agents, independent contractors, Subcontractors or suppliers, or anyone for whose acts the Contractor or any of the Contractor's agents, independent contractors, Subcontractors or suppliers may be liable, the defense and/or indemnification obligation herein shall not be limited by any limitation on amount or type of damages, compensation, or benefits payable by or for the Contractor or the Contractor's agents, independent contractors, Subcontractors or suppliers under workers' compensation acts, disability acts, or other employee benefit acts.

g. The indemnification obligations herein shall not be limited by any assertion or finding that the person or entity indemnified is liable by reason of a non-delegable duty.

h. The indemnities set forth herein shall not be limited by the insurance requirements set forth in the Contract Documents.

i. The indemnification requirements herein set forth shall extend to claims occurring after this Contract is terminated as well as while it is in force.

j. In the event the Contractor enters into any agreement with the owners of any adjacent property to enter upon or adjacent to such property for the purpose of performing this Contract, the Contractor shall fully indemnify, defend and save harmless such person, firm, or corporation, State or other governmental agency which owns or has any interest in the adjacent property. The form and content of the indemnification agreement shall be approved by NVTA prior to commencement of any work on or about such property. The Contractor also shall indemnify NVTA and other indemnities identified in this Section as provided in the Contract. These provisions shall be in addition to any other requirements of the owners of adjacent property.

**20. ASSIGNMENT.** Neither this Agreement nor any rights herein of Contractor shall be assigned without the written consent of NVTA first obtained.



**21. AMENDMENTS.** Any modification or amendment of any provision of this agreement shall be in writing and must be executed by both parties hereto.

**22. INCIDENTAL BENEFICIARIES.** It is expressly understood and agreed that the enforcement of these terms and conditions shall be reserved to NVTA and Contractor. Nothing contained in the Agreement shall give or allow any claim or right of action whatsoever by any third person. It is the express intent of NVTA and Contractor that any such person or entity, other than NVTA and Contractor, receiving services or benefits under this Agreement shall be deemed an incidental beneficiary.

**23. MISCELLANEOUS PROVISIONS.**

a. **Attorneys' Fees.** In the event an action or proceeding is instituted by either party for the breach or enforcement of any provision of this Agreement, the prevailing party shall be entitled to reasonable attorneys' fees according to law.

b. This Agreement shall be deemed to be made in, and the rights and liabilities of the parties, and the interpretation and construction of the Agreement governed by and construed in accordance with the laws of the State of California. Any legal action arising out of this Agreement shall be filed in and adjudicated by a state court in the County of Sacramento, State of California.

c. **Enforceability.** If any term or provision of this Agreement is found to be void, voidable, invalid or unenforceable by a court of competent jurisdiction under the laws of the State of California, any and all of the remaining terms and provisions of this Agreement shall remain binding.

d. **Time.** All times stated herein or in any other contract documents are of the essence.

e. **Binding.** This Agreement shall bind and inure to the heirs, devisees, assignees and successors in interest of Contractor and to the successors in interest of NVTA in the same manner as if such parties had been expressly named herein.

f. **Survivorship.** Any responsibility of Contractor for warranties, insurance, indemnity, record keeping or compliance with laws with respect to this Agreement shall not be invalidated due to the expiration, termination or cancellation of this Agreement.

g. **Waiver.** In the event that either NVTA or Contractor shall at any time or times waive any breach of this Agreement by the other, such waiver shall not constitute a waiver of any other or succeeding breach of this Agreement, whether of the same or any other covenant, condition or obligation. Waiver shall not be deemed effective until and unless signed by the waiving party.

**26. ENTIRE AGREEMENT.** This instrument and any attachments hereto constitute the entire Agreement between NVT A and Contractor concerning the subject matter hereof and supersedes any and all prior oral and written communications between the parties regarding the subject matter hereof.

**24. AUTHORITY TO EXECUTE.** The person or persons executing this Agreement on behalf of the parties hereto warrants and represents that he/she/they has/have the authority to execute this Agreement on behalf of their entity and has/have the authority to bind their party to the performance of its obligations hereunder.

**25. COUNTERPARTS.** This agreement may be executed in one or more counterparts, each of which shall be deemed an original, and will become effective and binding upon the parties at such time as all of the signatories hereto have signed a counterpart of this Agreement. All counterparts so executed shall constitute one Agreement binding on all of the parties hereto, notwithstanding that all of the parties are not signatory to the same counterpart.

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**SIGNATURE PAGE IMMEDIATELY FOLLOWS**

**IN WITNESS WHEREOF**, the parties hereto have signed the Agreement on the date set forth opposite their names.

**CONTRACTOR**

*(Must be signed by two (2) officers of the corporation in compliance with Corporations Code section 313.)*

\_\_\_\_\_  
Date

\_\_\_\_\_  
Tax I.D. Number

\_\_\_\_\_  
Signature

\_\_\_\_\_  
Signature

\_\_\_\_\_  
Print Name

\_\_\_\_\_  
Print Name

\_\_\_\_\_  
Title

\_\_\_\_\_  
Title

**NVTA**

A California Joint Powers Agency:

\_\_\_\_\_  
Date

\_\_\_\_\_  
KATE MILLER, Executive Director

ATTEST:

\_\_\_\_\_  
NVTA Board Secretary

APPROVED AS TO FORM:

\_\_\_\_\_  
NVTA General Counsel

# EXHIBIT A

Napa Valley Transportation Authority  
NVTA OFFICE TENANT IMPROVEMENTS

## ATTACHMENT 1

### BID SCHEDULE

ITEM	SPEC PROVISION	ITEM DESCRIPTION	QTY	UNIT	UNIT COST	TOTAL COST
1		MOBILIZATION / SITE MAINTENANCE / CLEAN-UP	1	EA	\$16,000.00	\$16,000.00
2		1 <sup>ST</sup> FLOOR	1	EA	\$544,000.00	\$544,000.00
<b>TOTAL BASE BID</b>					\$	560,000.00

### BID ALTERNATE 1 – ACCESSIBLE TECH POD

ITEM	SPEC PROVISION	ITEM DESCRIPTION	QTY	UNIT	UNIT COST	TOTAL COST
1		POD, ACCESSIBLE	1	EA	68,000.00	68,000.00
<b>SUB-TOTAL BID ALT 1</b>					\$	68,000.00

### BID ALTERNATE 2 – ACOUSTICAL WALL PANEL

ITEM	SPEC PROVISION	ITEM DESCRIPTION	QTY	UNIT	UNIT COST	TOTAL COST
1		WALL PANELING, ACOUSTICAL	1	EA	\$94,000.00	\$94,000.00
<b>SUB-TOTAL BID ALT 2</b>					\$	94,000.00

The basis of the award shall be to the lowest, responsive, responsible bidder on the "TOTAL BASE BID" Schedule Price only. Complete bids shall be submitted for all items on the Base Bid Schedule, Bid Alternate 1 Schedule, and Bid Alternate 2 Schedule. Failure to bid an item may be just cause for considering the bid as non-responsive. The Agency reserves the right to reject any or all Base Bids. It is the Agency's sole discretion to add, or not add, the Alternative Bid(s) to the Base Bid contract.

# EXHIBIT A

Napa Valley Transportation Authority  
NVTA OFFICE TENANT IMPROVEMENTS

\*Note: In case of error in extension of price into the total price column, the unit price will govern.

Total Amount of BASE Bid (written in words) is: <u>Five Hundred Sixty Thousand</u>
_____ Dollars and
<u>00/100</u> _____ Cents.
In the event of discrepancy between words and figures, the words shall prevail.
\$ <u>560,000.00</u>
_____ Figures

3165 CALISTOGA RD  
Address of Bidder

CC  
Signature of Bidder

SANTA ROSA, CA 95404  
City

CHRIS CARR  
Name of Bidder (Print)

707-539-8650  
Telephone Number of Bidder

N/A  
Fax Number of Bidder

556444  
Contractor's License Number

3/31/2026  
License's Expiration Date

## Addendum Acknowledgement

Addendum No. 1  
Signature Acknowledging Receipt: CC Date: 10/3/24

Addendum No. 2 CRDA MARKET  
Signature Acknowledging Receipt: CC Date: 9/30/24

# EXHIBIT B

## LIST OF SUBCONTRACTORS

Pursuant to Section 4100 to 4113 of the Public Contract Code, and NVTA instructions, each bidder shall complete and submit this form with his bid in accordance with the following instructions.

1. For each subcontract item to be performed by a subcontractor, the following shall be indicated herein: the name of the subcontractor, the portion of work to be performed, each subcontractor's license number, and the location of the place of business.
2. Only one subcontractor shall be listed for each craft unless there is an alternate bid in which case a different subcontractor, when so designated, may be listed for the alternate work.
3. **All fields must be completed as specified or the bid proposal may be rejected as non-responsive.**

Name of Subcontractor	Portion of Contract (i.e. Electrical, Striping, etc.)	Subcontractor License Number	DIR Registration Number1	Dollar Amount of Work to Be Performed	Location of Business (City and State)
B-K MUI	CASEWORK	428941	1000003062	\$35,000	NEWARK, CA
WEST COAST	INSULATION	732785	1000008589	\$4000.00	HATWARD, CA
OVERHEAD DOOR	OVERHEAD DOORS	281347	1000617892	\$6,500.00	SANTA ROSA, CA
AMERICAN DRYWALL	DRYWALL	809470	1000691490	\$20,000	SANTA ROSA, CA

All general contractors and subcontractors must be registered with DIR in conformance with Labor Code Section 1725.5 and 1771.1. By requesting the DIR registration numbers of all subcontractors, bidders are put on notice that if they list a subcontractor without a DIR registration number at the time of bid opening, the County, in its sole discretion, may find the failure intentional and find the bid non-responsive. DIR registration number lookup is available online at <https://efiling.dir.ca.gov/PWCR/Search>

**LIST OF SUBCONTRACTORS**

Pursuant to Section 41100 to 41113 of the Public Contract Code, and NVTA instructions, each bidder shall complete and submit this form with his bid in accordance with the following instructions.

1. For each subcontractor item to be performed by a subcontractor, the following shall be indicated herein: the name of the subcontractor, the portion of work to be performed, each subcontractor's license number, and the location of the place of business.
2. Only one subcontractor shall be listed for each craft unless there is an alternate bid in which case a different subcontractor, when so designated, may be listed for the alternate work.
3. **All fields must be completed as specified or the bid proposal may be rejected as non-responsive.**

Name of Subcontractor	Portion of Contract (i.e. Electrical, Striping, etc.)	Subcontractor License Number	DIR Registration Number <sup>1</sup>	Dollar Amount of Work to Be Performed	Location of Business (City and State)
Frost Tilt	TILE	830437	1000039153	\$35,000	Vallejo, CA
Division G Spc.	ACoustical	1003305	1000025918	\$90,000	Rohnert Park, CA
BS Mancini	FLOORING	229210	1000002989	\$11,000	Santa Rosa, CA
KBI	PAINTING	944475	1000005471	\$10,000	PETALUMA, CA

All general contractors and subcontractors must be registered with DIR in conformance with Labor Code Section 1725.5 and 1771.1. By requesting the DIR registration numbers of all subcontractors, bidders are put on notice that if they list a subcontractor without a DIR registration number at the time of bid opening, the County, in its sole discretion, may find the failure intentional and find the bid non-responsive. DIR registration number lookup is available online at <https://efiling.dir.ca.gov/PWCR/Search>

**LIST OF SUBCONTRACTORS**

Pursuant to Section 41100 to 41113 of the Public Contract Code, and NVT A instructions, each bidder shall complete and submit this form with his bid in accordance with the following instructions.

1. For each subcontract item to be performed by a subcontractor, the following shall be indicated herein: the name of the subcontractor, the portion of work to be performed, each subcontractor's license number, and the location of the place of business.
2. Only one subcontractor shall be listed for each craft unless there is an alternate bid in which case a different subcontractor, when so designated, may be listed for the alternate work.
3. **All fields must be completed as specified or the bid proposal may be rejected as non-responsive.**

Name of Subcontractor	Portion of Contract (i.e. Electrical, Striping, etc.)	Subcontractor License Number	DIR Registration Number <sup>1</sup>	Dollar Amount of Work to Be Performed	Location of Business (City and State)
MULPHY SPA.	TOILET VALVE	956735	1000004007	\$6200.00	VACAVILLE, CA
Draperly Concepts	SHADES	U15270	1000004501	\$4,000	Petaluma, CA
THE COLLECTIVE	OFFICE FURN.	1D10433	10000034869	\$50,000	SACRAMENTO / SAN JOSE CA
Hudark Field	FARE SPENCER	10789710	100011204 <del>100011204</del> 100011204	\$34,500	San Jose, CA

All general contractors and subcontractors must be registered with DIR in conformance with Labor Code Section 1725.5 and 1771.1. By requesting the DIR registration numbers of all subcontractors, bidders are put on notice that if they list a subcontractor without a DIR registration number at the time of bid opening, the County, in its sole discretion, may find the failure intentional and find the bid non-responsive. DIR registration number lookup is available online at <https://efiling.dir.ca.gov/PWCR/Search>



**LIST OF SUBCONTRACTORS**

Pursuant to Section 4100 to 4113 of the Public Contract Code, and NVT A instructions , each bidder shall complete and submit this form with his bid in accordance with the following instructions.

1. For each subcontract item to be performed by a subcontractor, the following shall be indicated herein: the name of the subcontractor, the portion of work to be performed, each subcontractor's license number, and the location of the place of business.
2. Only one subcontractor shall be listed for each craft unless there is an alternate bid in which case a different subcontractor, when so designated, may be listed for the alternate work.
3. **All fields must be completed as specified or the bid proposal may be rejected as non-responsive.**

Name of Subcontractor	Portion of Contract (i.e. Electrical, Striping, etc.)	Subcontractor License Number	DIR Registration Number <sup>1</sup>	Dollar Amount of Work to Be Performed	Location of Business (City and State)
Kress Plumbing	PUMPS	512710	1000000000	\$38,000	Pittsburg, CA
MATEX INC	MANAL	812232	1000003058	\$30,000	NOVATO, CA
Redden State Electrical	ELECTRICAL	683506	1000007879	\$104,000	SANTA ROSA, CA
	<del>MANUAL STRIPING</del>				

All general contractors and subcontractors must be registered with DIR in conformance with Labor Code Section 1725.5 and 1771.1. By requesting the DIR registration numbers of all subcontractors, bidders are put on notice that if they list a subcontractor without a DIR registration number at the time of bid opening, the County, in its sole discretion, may find the failure intentional and find the bid non-responsive. DIR registration number lookup is available online at <https://efiling.dir.ca.gov/PWCR/Search>

**LIST OF SUBCONTRACTORS**

Pursuant to Section 4100 to 4113 of the Public Contract Code, and NVTAA instructions, each bidder shall complete and submit this form with his bid in accordance with the following instructions.

1. For each subcontract item to be performed by a subcontractor, the following shall be indicated herein: the name of the subcontractor, the portion of work to be performed, each subcontractor's license number, and the location of the place of business.
2. Only one subcontractor shall be listed for each craft unless there is an alternate bid in which case a different subcontractor, when so designated, may be listed for the alternate work.
3. All fields must be completed as specified or the bid proposal may be rejected as non-responsive.

Name of Subcontractor	Portion of Contract (i.e. Electrical, Striping, etc.)	Subcontractor License Number	DIR Registration Number <sup>1</sup>	Dollar Amount of Work to Be Performed	Location of Business (City and State)
PACIFIC CONST CORP	SIGN COAT & DEMO	628194	1000003098	4000.00	PESALUMA, CA
	<del>PACIFIC CONST CORP</del>				
HTI	INS. ALUM DOORS	900312	1000009172	29,000	SANTA ROSA, CA

All general contractors and subcontractors must be registered with DIR in conformance with Labor Code Section 1725.5 and 1771.1. By requesting the DIR registration numbers of all subcontractors, bidders are put on notice that if they list a subcontractor without a DIR registration number at the time of bid opening, the County, in its sole discretion, may find the failure intentional and find the bid non-responsive. DIR registration number lookup is available online at <https://efiling.dir.ca.gov/PWCR/Search>

# EXHIBIT B

Napa Valley Transportation Authority  
 NVTA OFFICE TENANT IMPROVEMENTS

## LIST OF MATERIAL SUPPLIERS AND MATERIAL GUARANTEE

### LIST OF MATERIAL SUPPLIERS

The bidder is required to name the make and supplier of the material items listed below to be furnished under these specifications. The bidder shall name a manufacturer for each item and the supplier of the item if the supplier is not the manufacturer. The naming of more than one supplier for a single item or naming a supplier followed by the words "or equal" will not be acceptable. Substitution of any listed supplier following submission of this form with the Bid shall only be permitted as authorized by the ENGINEER pursuant to General Conditions Section 1-6.03.

Failure to complete this form and submit it with the bid proposal may cause the proposal to be rejected as being incomplete and not responsive to the solicitation.

Item	Supplier & Manufacturer	Address
<del>DOORS, FRAMES, PARTITIONS</del>	<del>CERO</del>	<del>9159 TELECOM DR MILAN, TN</del>
TILE	DAL TILE	5105 CAMPU DR PLYMOUTH MEETING, PA
ACOUSTICAL	ARMSTRONG	LANCASTER, PA
FLOORING	MOHAWK	CALHOUN, GA
TOILET ALL	BOBBIK	6901 TUSUNGA AVE NORTH HOLLYWOOD, CA
WALL MULLION	MULL-IT-OVER	1107 COLUMBUS AVE GRAND HAVEN, MI
STUCCO FRONT	OLDCASTLE	LOS ANGELES, CA

### LIST OF MATERIAL SUPPLIERS

In addition to completion of the list of material suppliers on the Material Suppliers form, the bidder may be required to furnish prior to award of contract, a complete statement of the origin, composition and manufacturer of any or all materials to be used in the construction of the work, together with samples, which samples may be subjected to test, provided for in the specifications, the General Conditions or Special Provisions to determine their quality and fitness for the work.

CARR'S CONST. SERVICE, INC.

# EXHIBIT C

## Napa Valley Transportation Authority Office Tenant Improvements

625 Burnell Street  
Napa, CA 94559

### Technical Specifications

Mar. 28, 2024

# EXHIBIT C

## Table of Contents

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### Technical Specifications

**Division 01 General Conditions:** Provided by Owner

**Division 2 – Existing Conditions**

Section 02 4100 Selective Demolition

**Division 3 – Concrete**

Section 03 1000 Concrete Forming and Accessories

Section 03 2000 Concrete Reinforcing

Section 03 3000 Cast-in-Place Concrete

**Division 5 - Metals**

Section 05 5000 Miscellaneous Metal Fabrications

**Division 6 – Wood, Plastics and Composites**

Section 06 1000 Rough Carpentry

Section 06 4023 Interior Architectural Woodwork

Section 06 6500 Solid Surfacing

**Division 7 - Thermal and Moisture Protection**

Section 07 1353 Elastomeric Sheet Waterproofing

Section 07 2100 Thermal and Acoustical Insulation

Section 07 4213 Metal Wall Panels

Section 07 9200 Joint Sealants

**Division 8 – Openings**

Section 08 1200 Metal Frames

Section 08 1216 Interior Aluminum Frames

Section 08 1400 Wood Doors

Section 08 3113 Access Doors and Frames

Section 08 3323 Overhead Doors

Section 08 7111 Door Hardware

Section 08 8000 Glazing

**Division 9 - Finishes**

Section 09 2900 Gypsum Board

Section 09 3000 Tile

Section 09 5100 Acoustical Ceilings

Section 09 6500 Resilient Base

Section 09 6813 Tile Carpeting

Section 09 8433 Sound Absorbing Wall Panels

Section 09 9100 Painting

Section 09 9300 Stained Concrete Finish

# EXHIBIT C

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### **Division 10 - Specialties**

Section 10 1400	Signage
Section 10 2800	Toilet & Shower Accessories
Section 10 4400	Fire Protection Specialties

### **Division 12 - Furnishings**

Section 12 2413	Window Roller Shades
Section 12 5100	Office Furniture

### **Division 21 – Fire Suppression**

Section 21 0000	Performance Specifications for Fire Suppression
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### **Division 22 – Plumbing**

Section 22 0000	Plumbing Requirements
Section 22 0100	Plumbing Materials and Methods
Section 22 0500	General Plumbing Systems
Section 2 20700	Plumbing Systems Insulation

### **Division 23 – Heating, Ventilation & Air Conditioning**

Section 23 0500	Heating, Ventilating and Air Conditioning
Section 23 0593	Testing, Adjusting and Balancing
Section 23 0700	HVAC Insulation
Section 23 3100	Ductwork
Section 23 3700	Air Outlets and Inlets

### **Division 26 – Electrical**

Section 26 0000	Basic Electrical Requirements
Section 26 0509	Equipment Wiring
Section 26 0526	Grounding and Bonding
Section 26 0529	Electrical Hangers and Supports
Section 26 0534	Boxes
Section 26 0553	Electrical Identification
Section 26 0923	Occupancy Sensors
Section 26 2416	Panelboards
Section 26 2726	Wiring Devices
Section 26 2818	Enclosed Switches and Circuit Breakers
Section 26 5100	Lighting

### **Division 28 – Electronic Safety and Security**

Section 28 3100	Fire Detection and Alarm: Contractor shall provide Design/Build of system modifications in the area of work. Original Building Specifications Section 16721 is included for reference.
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END OF TABLE OF CONTENTS

# EXHIBIT C

Selective Demolition Section 02 4100

## SELECTIVE DEMOLITION SECTION 02 4100

### 1 PART 1- GENERAL

#### 1.1 RELATED DOCUMENTS

- A. Drawings and general provisions of Contract, including General and Supplementary Conditions apply to this Section.

#### 1.2 SUBMITTALS

- A. General: Submit the following in accordance with General Conditions of the Contract.
  - 1. A written plan indicating type of work to be accomplished and calendar dates for expected work.
  - 2. Proposed schedule of operations coordination for shutoff, capping, and continuation of utility services as required.
  - 3. Photographs of existing area of work

#### 1.3 JOB CONDITIONS

- A. Condition of Existing Facilities: Owner assumes no responsibility for actual condition of facilities to be demolished.
  - 1. Conditions existing at time of inspection for bidding purpose will be maintained by Owner insofar as practicable. However, variations within facilities may occur, by owner's removal and salvage operations prior to start of demolition work.
- B. Salvaged Materials:
  - 1. Items of salvable value to Contractor may be removed as work progresses. Transport salvaged items from site as they are removed.
    - a. Storage or sale of removed demolition items will not be permitted on site.
  - 2. Items to be salvaged for incorporation into the work shall be stored by the contractor so as to prevent any damage to such salvaged items.
- C. Traffic: Conduct demolition operations and removal of debris to ensure minimum interference with roads, streets, driveways, walks, parking lot, access points and other adjacent occupied and used facilities.
  - 1. Do not close or obstruct driveways, streets, walks, parking lot or other occupied or used facilities without permission from authorities having jurisdiction or from NVTA . Provide alternate routes around closed or obstructed traffic ways.

# EXHIBIT C

## Selective Demolition Section 02 4100

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### D. Protections:

1. Ensure safe passage of persons around the project site and the area of demolition. Conduct operations to prevent damage to adjacent buildings, structures, and other facilities and injury to persons.
2. Provide plastic containment with zippered entrance at location shown on drawings.

E. Damages: Promptly repair damages caused to adjacent facilities by demolition operations.

F. Utility Services: Maintain existing utilities to stay in service and protect against damage during demolition operations. Do not interrupt existing utilities serving occupied or used facilities, except when authorized in writing by authorities having jurisdiction. Provide temporary services during interruptions to existing utilities, as acceptable to governing authorities.

### G. Regulatory Requirements:

1. Conform to applicable codes for demolition, safety of adjacent structures, dust control, and adjacent property owner safety.

H. Occupancy: Area to be remodeled will be vacated and use discontinued prior to start of work.

## 2 PRODUCTS (Not Applicable)

## 3 EXECUTION

### 3.1 DEMOLITION

A. Clean adjacent improvements of dust, dirt, and debris caused by demolition operations. Return adjacent areas to condition existing prior to start of work.

B. Demolition: Demolish portions of facilities completely and remove from site. Use such methods as required to complete work within limitations of governing regulations.

1. Proceed with demolition in systematic manner, from top of structure to ground. Complete demolition work above each floor or tier before disturbing supporting members on lower levels.

1. Demolish concrete and masonry in small sections

2. Remove structural framing members and lower to ground by hoists, derricks, or other suitable methods.

3. Break up and remove concrete slabs-on-grade, unless otherwise shown to remain.

4. Locate demolition equipment throughout structure and remove materials so as to not impose excessive loads to supporting walls, floors, or framing.

3.2 Below-Grade Construction: Demolish foundation walls and other below-grade construction, including concrete slabs, to a depth of not less than 12 inches below lowest foundation level.

3.3 Filling Voids: Completely fill below-grade areas and voids resulting from demolition of structures.



# EXHIBIT C

## Selective Demolition Section 02 4100

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1. Use satisfactory soil materials as defined in ASTM D 2487, consisting of stone, gravel, and sand, free from debris, trash, frozen materials, roots, and other organic matter.
  2. Prior to placement of fill materials, ensure that areas to be filled are free of standing water, frost, frozen material, trash, and debris.
  3. Place fill materials in horizontal layers not exceeding 6 inches in loose depth. Compact each layer at optimum moisture content of fill material to a density equal to original adjacent ground, but not less than 90 percent density when tested in accordance with ASTM D 1556, unless subsequent excavation for new work is required.
  4. After fill placement and compaction, grade surface to meet adjacent contours and to provide flow to surface drainage structures.
- 3.4 Pollution Controls: Use water sprinkling, temporary enclosures, and other suitable methods to limit dust and dirt rising and scattering in air. Comply with governing regulations pertaining to environmental protection.
- 3.5 DISPOSAL OF DEMOLISHED MATERIALS
- A. General: Remove weekly from site accumulated debris, rubbish, and other materials resulting from demolition operations.
    1. Burning of combustible materials from demolished structures will not be permitted on site.
  - B. Removal: Transport materials removed from demolished structures and legally dispose off site.

**END OF SECTION 02 4100**

# EXHIBIT C

Concrete Forming and Accessories Section 03 1000

## CONCRETE FORMING AND ACCESSORIES

SECTION 03 1000

### PART 1 – GENERAL

#### 1.1 SUMMARY

- A. Section Includes: All labor, materials and equipment and all operations required to complete all formwork as indicated on the drawings; to produce shapes and configurations as shown, as required; and as specified herein, including:
  - 1. Forms, shores, bracing, removal and other operations as necessary for all cast-in-place concrete and masonry placed.
  - 2. Setting and securing anchor bolts and other metal items embedded in concrete into formwork, using materials and layouts furnished and delivered to jobsite as specified under other sections.
- B. Related Sections:
  - 1. Pertinent Sections of Division 03 specifying concrete construction.
  - 2. Pertinent Sections of other Divisions specifying work to be embedded in concrete or work penetrating concrete foundations and formwork.

#### 1.2 REFERENCES

- A. California Code of Regulations, Title 24, latest adopted edition (herein noted as CBC): Chapter 19 Concrete.
- B. American Concrete Institute (ACI) PRC-347 "Guide to Formwork for Concrete".
- C. American Plywood Association (APA) "Concrete Forming Guide".
- D. West Coast Lumberman Inspection Bureau (WCLIB) "Standard Grading Rules for West Coast Lumber".
- E. ACI MNL-066 "ACI Detailing Manual".
- F. ACI SPEC-301 "Specifications for Concrete Construction".
- G. Concrete Reinforcing Steel Institute (CRSI) "Manual of Standard Practice".

#### 1.3 DESIGN REQUIREMENTS

- A. Design, engineer, and construct formwork, shoring and bracing to conform to design and code requirements, resist imposed loads; resultant concrete to conform to required shape, line and dimension.

#### 1.4 SUBMITTALS

# EXHIBIT C

## Concrete Forming and Accessories Section 03 1000

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- A. Limitation of review: Structural Engineer's review will be required only where specifically requested for general architectural applications and features only. Contractor is responsible for structural stability, load-resisting characteristics and sufficiency of form work design.

### 1.5 QUALITY ASSURANCE

- A. General: All form materials shall be new at start of work. Produce high quality concrete construction. Minimize defects due to joints, deflection of forms, roughness of forms, nonconforming materials, concrete or workmanship.
- B. Reuse of Forms: Plywood forms may be reused, if thoroughly cleaned of all dirt, mortar, and foreign materials, and undamaged at edges and contact face. Reuse shall be subject to permission from the Architect without exception, and issued in writing. Reuse of any panel which will produce a blemish on exposed concrete, will not be permitted.

## PART 2 – PRODUCTS

### 2.1 MATERIALS

- A. Form Materials:
  - 1. Non-Exposed Surface Formwork Facing: Forms for concrete which is not exposed to view, may be of plywood as specified for exposed surfaces, or square edge 1x nominal Douglas Fir, Construction Grade, S4S.
  - 2. Exposed Surface Formwork Facing:
    - a. Forms for all exterior and interior concrete flat surfaces unless otherwise specified as board formed shall be new Douglas Fir Plywood (APA) ply, 5/8-inch, B-B Plyform, Class 1, Exterior Type, oiled and edged and edge-sealed conforming to U.S. Product Standard PS 1 in large sheet sizes to achieve joint patterns shown.
    - b. All exposed concrete edges shall be chamfered 3/4" minimum or as noted on the drawings.
  - 3. Exposed Surface Formwork - Special Pattern Form Liner:
    - a. Forms for all exterior and interior concrete flat surfaces indicated shall be as designated by Architect.
- B. Earth Forms: Allowed, subject to soil standing in excavations without ravel or caving.
- C. Form Release Agent: Spray-on compound, not affecting color, bond or subsequent treatment of concrete surfaces. Maximum VOC content shall comply with local requirements and California Green Building Code.
- D. Accessories: Types recommended by manufacturers or referenced standards to suit conditions indicated;
  - 1. Anchors, spacers, void in-fill materials: sized to resist imposed loads.
  - 2. Form Ties: Prefabricated rod, flat band, or wire snap ties with 1" break-back or threaded internal disconnecting type with external holding devices of adequate bearing area. Ties shall permit tightening and spreading of forms and leave no metal closer than 1" to surface.
- E. Corner Chamfers and Rustications: Filleted, wood strip or foam type; sizes and shapes as detailed, or 3/4 x 3/4 inch size minimum if not detailed; maximum possible lengths.

# EXHIBIT C

- F. Nails, Spikes, Lag Bolts, Through Bolts, Anchorages: Sized as required, of sufficient strength and character to maintain formwork in place while placing concrete.

## PART 3 – EXECUTION

### 3.1 EXAMINATION

- A. Inspect the substrate and the conditions under which concrete formwork is to be performed. Correct conditions detrimental to timely and proper completion of the work. Do not proceed with the work until unsatisfactory conditions have been corrected. Commencement of work indicates acceptance of substrates and conditions.
- B. Verify lines, levels and centers before proceeding with formwork. Ensure that dimensions agree with drawings.

### 3.2 EARTH FORMS

- A. If natural soil or compacted fill can be accurately cut and maintained, foundations may be poured against earth without forming. Provide positive protection of trench top corners.
- B. Maintain earth forms free of water and foreign materials.

### 3.3 ERECTION – FORMWORK

- A. General: Construct formwork in accordance with calculations, and recommendations of ACI PRC-347. Construct forms to the sizes, shapes, lines and dimensions shown, and as required to obtain accurate alignment, location, grades, level and plumb work in finished structure. Provide for openings, offsets, sinkages, keyways, recesses, moldings, rustications, reglets, chamfers, blocking, screeds, bulkheads, anchorages and inserts, and other features required. Use selected materials to obtain required finishes.
  - 1. Construct cambers specified in concrete members and slabs in the formwork.
  - 2. Schedule the work and notify other trades in ample time so that provisions for their work in the formwork can be made without delaying progress of the project. Install all sleeves, pipes, etc. for building services systems, or other work. Secure information about and provide for all openings, offsets, recessed nailing blocks, channel chases, anchors, ties, inserts, etc. in the formwork before concrete placement.
  - 3. Deflection: Formwork and concrete with excessive deflection after concrete placement will be rejected. Excessive deflection is that which will produce visible and noticeable waves in the finished concrete.
- B. Formwork Construction: Erect formwork, shoring and bracing to achieve design requirements, in accordance with requirements of ACI SPEC-301. Uniform, substantial and sufficiently tight to prevent leakage of concrete paste, readily removable without impact, shock or damage to cast-in-place concrete surfaces and adjacent materials. Tie, brace, shore, and support to insure stability against pressures from any source, without failure of any component part and without excessive deflection. Solidly butt joints and provide backup material at joints as required to prevent leakage and fins.
- C. Provide all openings, offsets, inserts, anchorages, blocking, and other features of the work as shown or required. See INSERTS, EMBEDDED PARTS, AND OPENINGS for detailed requirements.

# EXHIBIT C

## Concrete Forming and Accessories Section 03 1000

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- D. Warped, checked, or scuffed forms will be rejected.
- E. Maintain membranes, reinforcing and other work free of damage; protect with plywood runway boards or other positive, durable means.
- F. Align joints and make watertight. Keep form joints to a minimum.
- G. Unexposed corners may be formed either square or chamfered.
- H. Ties and Spreaders: Arrange in a pattern acceptable to the Architect when exposed. Snap-ties may be used except at joints between pours where threaded internal disconnecting type shall be used.
- I. Coordinate this section with other sections of work that require attachment of components to formwork.

### 3.4 APPLICATION - FORM RELEASE AGENT

- A. Apply form release agent on formwork in accordance with manufacturer's recommendations.
- B. Apply prior to placement of reinforcing steel, anchoring devices, and embedded items.
- C. Do not allow excess form coating material to accumulate in the forms or to come into contact with reinforcement or surfaces which will be bonded to fresh concrete.
- D. Coat steel forms with a non-staining, rust-preventative form oil or otherwise protect against rusting. Rust-stained steel formwork will be rejected.
- E. Leave no residue or stain on the face of the concrete, nor affect bonding of subsequent finishes or work specified in other sections.

### 3.5 INSERTS, EMBEDDED PARTS, AND OPENINGS

- A. Provide formed openings where required for items to be embedded in passing through concrete work.
  - 1. Provide openings in concrete formwork to accommodate work of other sections including those under separate contracts (if any). Size and location of openings, recesses and chases shall be in accordance with the section requiring such items. Accurately place and securely support items to be built into forms.
- B. Construction Joints: Construct and locate generally as indicated on Drawings and only at locations approved by Structural Engineer, so as not to impair the strength of the structure. Form keys in all cold joints shown or required.
- C. Locate and set in place items that will be cast directly into concrete.
- D. Rough Hardware and Miscellaneous Metal: Set inserts, sleeves, bolts, anchors, angles, and other items to be embedded in concrete. Set embedded bolts and sleeves for equipment to template and approved shop drawings prepared by trades supplying equipment.

# EXHIBIT C

## Concrete Forming and Accessories Section 03 1000

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- E. Coordinate with work of other sections in forming and placing openings, slots, reglets, recesses, sleeves, bolts, anchors, other inserts, and components of other work.
- F. Install accessories in accordance with manufacturer's instructions, so they are straight, level, and plumb. Ensure items are not disturbed during concrete placement.
- G. Piping: Do not embed piping in structural concrete unless locations specifically approved by Structural Engineer.
- H. Conduit: Place conduit below slabs-on-grade and only as specifically detailed on structural drawings. Minimum clear distance between conduits shall be 3 diameters. Location shall be subject to Engineer's written approval and shall not impair the strength of the structure.
- I. Provide temporary ports or openings in formwork where required to facilitate cleaning and inspection. Locate openings at bottom of forms to allow flushing water to drain.
  - 1. Provide openings for the introduction of vibrators at intervals necessary for proper placement.
  - 2. Close temporary openings with tight fitting panels, flush with inside face of forms, and neatly fitted so joints will not be apparent in exposed concrete surfaces.
- J. Install Form Liner inserts in accordance with manufacturer's recommendations, to produce patterns and textures indicated.

### 3.6 FORM CLEANING

- A. Clean forms as erection proceeds, remove foreign matter within forms.
- B. Clean formed cavities of debris prior to placing concrete.
  - 1. Remove all dirt, chips, sawdust, rubbish, water and foreign materials detrimental to concrete.
  - 2. Flush with water or use compressed air to remove remaining foreign matter. Ensure that water and debris drain to exterior through clean-out ports.

### 3.7 EQUIPMENT BASES

- A. Form concrete bases for all mechanical and electrical equipment in accordance with approved shop details furnished by other sections.
- B. Sizes and locations as indicated and as required to produce results shown.
- C. Provide coved base for all equipment bases placed on concrete slabs.

### 3.8 FORMWORK TOLERANCES

- A. Construct formwork to maintain tolerances required by ACI SPEC-301.

### 3.9 FIELD QUALITY CONTROL

- A. Inspect erected formwork, shoring, and bracing to ensure that work is in accordance with formwork design, and to verify that supports, fastenings, wedges, ties, and items are secure.

# EXHIBIT C

## Concrete Forming and Accessories Section 03 1000

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- B. Do not reuse wood formwork more than 2 times for concrete surfaces to be exposed to view. Do not patch formwork.
- C. Clean and repair surfaces to be re-used in the work. Split, frayed, delaminated or otherwise damaged form facing material will not be acceptable. Apply new form coating compound material to concrete contact surfaces as specified for new formwork.
- D. When forms are extended for successive concrete placement, thoroughly clean surfaces, remove fins and laitance, and tighten forms to close all joints. Align and secure joints to avoid offsets.

### 3.10 FORM REMOVAL

- A. Do not loosen or remove forms before minimum curing period has elapsed without employment of appropriate alternate curing methods, approved by the Architect in writing.
- B. Remove forms without damage to the concrete using means to ensure complete safety of the structure and without damage to exposed edges, chamfers and inserts. Loosen forms carefully. Do not wedge pry bars, hammers, or tools against finish concrete surfaces scheduled for exposure to view.
- C. Do not remove forms until the concrete has hardened sufficiently to permit safe removal and the concrete has attained sufficient strength to safely support imposed loads. The minimum elapsed time for removal of forms after concrete has been placed shall be as follows:
  - 1. Footings: 7 days minimum. If backfilled immediately, side forms may be removed 24 hours after concrete is placed.
- D. Durations listed above are minimums and are subject to extension at the sole judgment of the Architect/Engineer.
- E. Do not subject concrete to superimposed loads (structure or construction) until it has attained full specified design strength, nor for a period of at least 14 days after placing.
- F. Store removed forms to prevent damage to form materials or to fresh concrete. Discard damaged forms.

### 3.11 CLEANING

- A. Remove excess material and debris associated with this work from the job site.

END OF SECTION

# EXHIBIT C

Concrete Reinforcing Section 03 2000

## CONCRETE REINFORCING

SECTION 03 2000

### PART 1 – GENERAL

#### 1.1 SUMMARY

A. Section Includes:

1. Reinforcing steel work for all concrete and masonry work as indicated on the drawings and specified herein.
2. Coordinate this work with other work affected by these operations, such as forms, electrical work, mechanical work, structural steel, masonry and concrete.

B. Related Sections:

1. Pertinent Sections of Divisions 03 specifying concrete construction.
2. Pertinent Sections of other Divisions specifying work to be embedded in concrete or work penetrating concrete work.

#### 1.2 REFERENCE STANDARDS

- A. California Code of Regulations, Title 24, latest adopted edition (herein noted as CBC) Chapter 19 Concrete.
- B. American Concrete Institute (ACI) SPEC-301 "Specifications for Concrete Construction".
- C. ACI CODE-318 "Building Code Requirements for Structural Concrete and Commentary".
- D. ACI MNL-066 "ACI Detailing Manual".
- E. ASTM A615 "Standard Specification for Deformed and Plain Carbon-Steel Bars for Concrete Reinforcement".
- F. Concrete Reinforcing Steel Institute (CRSI) - "Manual of Standard Practice".
- G. CRSI - "Placing Reinforcing Bars".

#### 1.3 SUBMITTALS

- A. Limitation of Review: Structural Engineer's review will be for general conformance with design intent as indicated in the Contract Documents and does not relieve Contractor of full responsibility for conformance with the Contract Documents. The General Contractor shall review and approve shop drawings prior to submittal to the Architect/Engineer.
- B. Shop Drawings: Show complete fabrication and placing details of all reinforcing steel. Comply with requirements of ACI MNL-66. Include:
  1. Bar sizes and schedules;
  2. Shapes of bent bars, layout and spacing of bars, location of splices.
  3. References to Contract Document detail numbers and designations.



# EXHIBIT C

- C. Product Data: Submit manufacturer's product data, specifications, location and installation instructions for proprietary materials and reinforcement accessories. Provide samples of these items upon request.
- D. Certificates: Submit all certifications of physical and chemical properties of steel for each heat number as manufactured, including location of material in structure as specified below in Article titled QUALITY ASSURANCE. All materials supplied shall be tagged with heat numbers matching submitted Mill Test Report analyses.
- E. Samples: Provide to the Owner's Testing laboratory as specified in Article SOURCE QUALITY CONTROL.

## 1.4 QUALITY ASSURANCE

- A. Perform work of this Section in accordance with the CRSI "Manual of Standard Practice", CRSI "Placing Reinforcing Bars", ACI SPEC-301, and ACI CODE-318.
- B. Requirements of Regulatory Agencies, refer to pertinent Sections of Division 01 and CBC.
- C. Certification and Identification of Materials and Uses: Provide Owner's Testing Agency with access to fabrication plant to facilitate inspection of reinforcement. Provide notification of commencement and duration of shop fabrication in sufficient time to allow inspection and all material identification/test information listed below.
  - 1. Provide manufacturer's Mill Test Reports for all materials. Include chemical and physical properties of the material for each heat number manufactured. Tag all fabricated materials with heat number.
  - 2. Provide letter certifying all materials supplied are from heat numbers covered by supplied mill certificates. Include in letter the physical location of each grade of reinforcing and/or heat number in the project (i.e. foundations, etc.).
  - 3. Unidentified Material Tests: Where identification of materials by heat number to mill tests cannot be made, Owner's Testing Agency shall test unidentified materials as described below.
- D. Testing and Inspection: Tests and Inspections required by Independent Testing Agency are specified below in Articles SOURCE QUALITY CONTROL and FIELD QUALITY CONTROL. Duties and limitations of Independent Testing Agency, test costs and test reports in conformance with pertinent Sections of Division 01.

## 1.5 DELIVERY, STORAGE AND HANDLING

- A. Comply with pertinent requirements of Division 01.
- B. Deliver reinforcement to project site in bundles marked with durable tags indicating heat number, mill, bar size and length, proposed location in the structure and other information corresponding with markings shown on placement diagrams.
- C. Handle and store materials above ground to prevent damage, contamination or accumulation of dirt or rust.

## PART 2 – PRODUCTS

### 2.1 MATERIALS

# EXHIBIT C

## Concrete Reinforcing Section 03 2000

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- A. Reinforcing Steel: Deformed billet steel bars ASTM A615 Grade 60.
  - 1. All reinforcement to be unfinished.
- B. Tie Wire: No. 16 AWG or heavier, black annealed.
- C. Concrete Blocks: On-grade conditions only, as required to support reinforcing bars in position.
- D. Reinforcing Supports: Plastic or galvanized steel chairs, bolsters, bar supports, or spacers sized and shaped for adequate support of reinforcement and construction loads imposed during concrete placement, meeting ACI and CRSI standards.
  - 1. For use over formwork: Galvanized wire bar type supports complying with CRSI recommendations. Provide plastic tips where exposed to view or weather after removal of formwork. Do not use wood, brick, or other unacceptable materials.
- E. Reinforcement Splice Couplers: For use only where specified on drawings. Submit other locations proposed for use to Engineer for review. "L-Series Bar Lock" Coupler Systems for Splicing Reinforcement Bars, UES ER-0319, by Dayton-Superior Corporation.

### 2.2 FABRICATION

- A. Fabricate concrete reinforcing in accordance with CRSI (DA4), unless specifically shown otherwise. Details not specifically shown or indicated shall conform to SP-066 and specified codes and standards.
  - 1. Accurately shop-fabricate to shapes, bends, sizes, gauges and lengths indicated or otherwise required.
  - 2. Bend bars once only. Discard bars improperly bent due to fabricating or other errors and provide new material; do not re-bend or straighten unless specifically indicated. Rebending of reinforcement in the field is not allowed.
  - 3. Do not bend reinforcement in a manner that will injure or weaken the material or the embedding concrete.
  - 4. Do not heat reinforcement for bending. Heat-bent materials will be rejected.
- B. Unacceptable materials: Reinforcement with any of the following defects will not be permitted in the work.
  - 1. Bar lengths, depths and bends exceeding specified fabrication tolerances.
  - 2. Bends or kinks not indicated on Drawings or final shop drawings.
  - 3. Bars with reduced cross-section due to rusting or other cause.
- C. Tag reinforcement with durable identification to facilitate sorting and placing.
- D. Shop Fusion Welded Stirrup/Tie/Spiral Cages
  - 1. Shop fusion welding of stirrup/tie/spiral cages is permitted to aid in fabrication and handling. The following requirements shall be met.
  - 2. All reinforcing bars receiving weld shall be ASTM A706.
  - 3. Longitudinal holding wires shall be ASTM A1064.
  - 4. Shop welding shall be performed by machines under a continuous, controlled process.
  - 5. Quality control tests shall be performed on shop-welded specimens and the test results shall be available, upon request, to the Architect/Engineer.

# EXHIBIT C

## Concrete Reinforcing Section 03 2000

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6. Tack welding of reinforcing steel is not permitted.
7. Welding of any type shall not occur at 90°, 135°, or 180° bends. Circular ties and spirals may be shop fusion welded outside of areas with 90°, 135°, or 180° hook bends.
8. Longitudinal bars shall not be welded to stirrups/ties/spirals.

### 2.3 SOURCE QUALITY CONTROL

- A. The Testing Agency, as specified in the Article QUALITY ASSURANCE, will perform the following:
  1. Material Testing:
    - a. Identified Steel: When samples are taken from bundled steel identified by heat number, matched with accompanying mill analyses as delivered from the mill, supplemental testing of reinforcing steel is not required.
    - b. Unidentified Steel: When identification of materials by heat number matched to accompanying mill analyses cannot be made, perform one tensile test and one bend test per each two and one-half tons or fraction thereof for each required size of reinforcing steel. Tests of unidentified steel shall be performed by the Owner's Testing Agency and costs for these tests shall be paid by the Contractor by deductive change order.

## PART 3 – EXECUTION

### 3.1 EXAMINATION

- A. Inspect the conditions under which concrete reinforcement is to be placed. Do not proceed with the work until unsatisfactory conditions have been corrected.
- B. Coordinate with work of other sections to avoid conflicts or interference. Bring conflicts between reinforcement and other elements to Architect's attention. Resolve conflicts before concrete is placed.
- C. Notify Architect, Structural Engineer, and Authority Having Jurisdiction for review of steel placement not less than 48 hours before placing concrete.

### 3.2 PLACEMENT

- A. General: Comply with the specified codes and standards, and Concrete Reinforcing Steel Institute recommended practice for "Placing Reinforcing Bars", for details and methods of reinforcement placement and supports, and as herein specified.
- B. Clean bars free of substances which are detrimental to bonding. Maintain reinforcement clean until embedded in concrete.
- C. Place reinforcement to obtain the minimum coverages for concrete protection. Do not deviate from required position. Maintain required distance, spacing and clearance between bars, forms, and ground.
- D. Location and Support: Provide metal chairs, runners, bolsters, spacers and hangers, as required.
- E. Provide additional steel reinforcement as necessary or as directed, to act as spreaders or separators to maintain proper positioning.

# EXHIBIT C

## Concrete Reinforcing Section 03 2000

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- F. Tying and Attachment: Securely tie at all intersections and supports with wire. Prevent dislocation or movement during placement of concrete. Direct twisted ends of wire ties away from exposed concrete surfaces.
- G. Separate reinforcing from pipes or conduits with approved non-metallic separators. Do not use wood or steel form stakes or reinforcement used as stakes as support for reinforcement.
- H. Accommodate placement of formed openings required by other sections.
- I. Obstructions:
  - 1. Where obstructions, block-outs, or penetrations (conduits, raceways, ductwork) prevent continuous placement of reinforcement as indicated, provide additional reinforcing as detailed and as directed by the Structural Engineer to supplement the indicated reinforcement around the obstruction.
  - 2. Place additional trim bars, ties, stirrups, or other elements as detailed and as directed at all opening, sleeves, pipes or other penetrations through structural elements.

### 3.3 REINFORCING SPACING AND COVERAGE

- A. Spacing: Do not space bars closer than four (4) diameters of the largest of two adjacent bars, except at bar laps, which shall be placed such that a minimum of 2 bar diameters is clear between bars.
- B. Where reinforcing in members is placed in two layers, the distance between layers shall not be less than four bar diameters of the largest bar and the bars in the upper layers shall be placed directly above those in the bottom layer, unless otherwise detailed or dimensioned.
- C. Coverage of bars (including stirrups and columns ties) shall be as follows, unless otherwise shown:
  - 1. Concrete cast against earth or grade: 3 inches.
  - 2. Concrete exposed to weather or formed and exposed to earth:
    - a. #5 & smaller: 1-1/2 inches.
    - b. #6 & larger: 2 inches.
  - 3. Concrete not exposed to earth or weather:
    - a. #5 & smaller: 1 inch.
    - b. #6 & larger: 1-1/2 inches.

### 3.4 DOWELS, SPLICES, OFFSETS AND BENDS

- A. Provide standard reinforcement splices at splices, corners, and intersections by lapping ends, placing bars in contact, and tightly tying with wire at each end. Comply with details shown on structural drawings and requirements of ACI CODE-318.
- B. Provide minimum 1-1/2 inch clearance between sets of splices. Stagger splices in horizontal bars so that adjacent splices will be 4 feet apart.
- C. Laps of welded wire reinforcement shall be at least two times the spacing of the members in the direction lapped but not less than twelve inches.
- D. Splices of reinforcement shall not be made at points of maximum stress. Provide splice lengths as noted on the structural drawings, with sufficient lap to transfer the stress between bars by bond and shear.

# EXHIBIT C

## Concrete Reinforcing Section 03 2000

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- E. Spacing:
  - 1. Space bars minimum distance specified and all lapped bars 2 bar diameters (minimum) clear of the next bar.
  - 2. Stagger splices of adjacent bars where possible and where required to maintain bar clearance.
  - 3. Request Architect/Engineer review prior to placement for all splices not shown on the drawings.
- F. Reinforcement Couplers: Install at all locations indicated. Install couplers in accordance with manufacturer's recommendations.

### 3.5 WELDING

- A. No reinforcing shall be welded unless specifically indicated. No reinforcing shall be welded without prior approval of the Structural Engineer and the Authority Having Jurisdiction.

### 3.6 MISPLACED REINFORCEMENT

- A. Notify Architect/Engineer immediately if reinforcing bars are known to be misplaced after concrete has been placed.
- B. Perform no correction or cutting without specific direction. Do not bend or kink misplaced bars.
- C. Correct misplaced reinforcing only as directed in writing by the Architect/Engineer. Bear all costs of redesign, new, or additional reinforcing required because of misplaced bars at Contractor's expense.

### 3.7 FIELD QUALITY CONTROL

- A. The Testing Agency as specified in the Article QUALITY ASSURANCE, will inspect the work for conformance to contract documents before concrete placement.
  - 1. Inspection: Provide inspection and verification of installed reinforcement. Confirm that the surface of the rebar is free of form release oil or other coatings.
  - 2. Exception: Shallow foundations & non-structural slabs-on-grade supporting buildings of no greater than three stories and either of concrete design strength 2500psi (or greater) or supporting light-frame construction do not require special inspection. Non-structural patios, driveways, and sidewalks do not require special inspection.

### 3.8 CLEANING

- A. Remove excess material and debris associated with this work from the job site.

END OF SECTION

# EXHIBIT C

Cast-in-place Concrete Section 03 3000

## CAST-IN-PLACE CONCRETE

SECTION 03 3000

### PART 1 – GENERAL

#### 1.1 SUMMARY

- A. Section Includes: Provide all labor, materials, equipment and services to complete all concrete work required, including, but not limited to, the following:
1. Foundations, slabs-on-ground.
  2. Installation of all bolts, inserts, sleeves, connections, etc. in the concrete.
  3. Joint devices associated with concrete work.
  4. Miscellaneous concrete elements, including, but not limited to: equipment pads, light pole bases, flagpole bases, thrust blocks, and manholes.
  5. Concrete curing.
  6. Coordination with other sections:
    - a. Make all preparations and do all work necessary to receive or adjoin other work. Install all bolts and anchors, including those furnished by other sections, into formwork and provide all required blocking.
    - b. Install all accessories embedded in the concrete and provide all holes, blockouts and similar provisions necessary for the work of other sections. Provide all patching or cutting made necessary by failure or delay in complying with this requirement at the Contractor's expense.
    - c. Coordinate with other sections for the accurate location of embedded accessories.
- B. Related Sections:
1. Pertinent Sections of Division 01 specifying Quality Control and Testing Laboratory services.
  2. Pertinent Sections of Division 03 specifying concrete construction.
  3. Pertinent Sections of other Divisions specifying work to be embedded in concrete or work penetrating concrete.
  4. Pertinent sections of other Divisions specifying floor finishes and sealants applied to concrete substrates.

#### 1.2 REFERENCES

- A. California Code of Regulations, Title 24, latest adopted edition (herein noted as CBC) Chapter 19 Concrete.
- B. American Concrete Institute (ACI) PRC-211.1 "Standard Practice for Selecting Proportions for Normal, Heavyweight, and Mass Concrete"
- C. ACI SPEC-301 "Specifications for Concrete Construction".
- D. ACI PRC-302.1 "Guide for Concrete Floor and Slab Construction".
- E. ACI PRC-304 "Guide for Measuring, Mixing, Transporting, and Placing Concrete".
- F. ACI SPEC-305.1 "Specification for Hot Weather Concreting".

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Cast-in-place Concrete Section 03 3000

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- G. ACI SPEC-306.1 "Standard Specification for Cold Weather Concreting".
- H. ACI SPEC-308.1 "Specification for Curing Concrete".
- I. ACI CODE-318 "Building Code Requirements for Structural Concrete and Commentary".

## 1.3 SUBMITTALS

- A. Submit in accordance with pertinent sections of Division 01 specifying submittal procedures. The General Contractor shall review and approve shop drawings prior to submittal to the Architect/Engineer. Submittals that do not meet these requirements will be returned for correction without review. Submit for review prior to fabrication.
- B. Limitation of Review: Structural Engineer's review will be for general conformance with design intent as indicated in the Contract Documents and does not relieve Contractor of full responsibility for conformance with the Contract Documents.
- C. Product Data: Submit manufacturers' data on manufactured products and other concrete related materials such as bond breakers, cure/sealer, admixtures, etc. Demonstrate compliance with specified characteristics. Provide samples of items upon request.
- D. Mix Designs: Submit Mix Designs for each structural concrete type required for work per requirements of articles CONCRETE MIXES and QUALITY ASSURANCE. Resubmit revised designs for review if original designs are adjusted or changed for any reason. Non-Structural mixes need not be submitted for review by Structural Engineer.
- E. Shop Drawings: Proposed location of construction and cold joints. Proposed location of all slab construction/dowel joints, control joints, and blockouts.
- F. Manufacturer's Installation Instructions: Indicate installation procedures and interface required with adjacent construction for concrete accessories.
- G. Batch Plant Ticket: Include with delivery of each load of concrete. Provide ticket to the Testing Agency and the Architect/Engineer as separate submittals. Concrete delivered to the site without such ticket shall be rejected and returned to the plant. Each ticket shall include all information specified in Article SOURCE QUALITY CONTROL below.
- H. Engineering Analysis: Prepared by a California-licensed Civil or Structural Engineer, justifying construction-imposed loads on slabs which exceed those allowed by CBC for the specified use.
  - 1. 2000 lbs maximum allowable construction load without analysis.
  - 2. 10,000 lbs maximum allowable construction load with analysis.
- I. Project Record Documents: Accurately record actual locations of embedded utilities and components that will be concealed from view upon completion of concrete work.

## 1.4 QUALITY ASSURANCE

- A. Perform work of this section in accordance with ACI SPEC-301 and ACI CODE-318.
- B. Concrete construction verification and inspection to conform to CBC 1705.3.
- C. Common Sourcing: Provide each of the following materials from consistent sources for entire project.

# EXHIBIT C

Cast-in-place Concrete Section 03 3000

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1. Cement.
2. Fly ash.
3. Aggregate.
4. Slag Cement.

D. Follow requirements of ACI SPEC-305.1 when concreting during hot weather. Follow requirements of ACI SPEC-306.1 when concreting during cold weather.

E. Services by the Independent Testing Agency (includes "Special" Inspections) as specified in this Section and as follows:

1. Perform tests and inspections specified below in articles SOURCE QUALITY CONTROL and FIELD QUALITY CONTROL. Duties and limitations of Independent Testing Agency, test costs and reports to be in conformance with pertinent Sections of Division 01.

F. Contractor shall bear the entire cost of remediation, removal, and/or replacement of concrete determined defective or non-conforming, including Architect/Engineer fees for redesign.

## 1.5 DELIVERY, STORAGE, AND HANDLING

A. Materials specified by brand name shall be delivered in unbroken packages bearing manufacturer's label and shall be brand specified or an approved equal.

B. Delivery, Handling and Storage of other materials shall conform to the applicable sections of the current editions of the various reference standards listed in this Section.

C. Protect materials from weather or other damage. Sort to prevent inclusion of foreign materials.

D. Specific Requirements:

1. Cement: Protect against dampness, contamination, and warehouse set. Store in weather tight enclosures.
2. Aggregates: Prevent excessive segregation, or contamination with other materials or other sizes of aggregates. Use only one supply source for each aggregate stock pile.
3. Admixtures:
  - a. Store to prevent contamination, evaporation, or damage.
  - b. Protect liquid admixtures from freezing and extreme temperature ranges.
  - c. Agitate emulsions prior to use.

## 1.6 ENVIRONMENTAL REQUIREMENTS

A. Cold Weather (Freezing or near-freezing temperatures) per ACI SPEC-306.1:

1. Heat concrete materials before mixing, as necessary to deposit concrete at a temperature of at least 50°F but not more than 90°F.
2. Do not place concrete during freezing, near-freezing weather, snow, rain or sleet unless protection from moisture and/or cold is provided.
3. Protect from freezing and maintain at a temperature of at least 50°F for not less than seven days after placing. Take special precautions to protect transit-mixed concrete.
4. No salts, chemical protection or admixture are permitted without written approval of Architect/Engineer.
5. Contractor shall maintain an air temperature log for the first 7 days after placement with entry intervals not to exceed 8 hours.



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- B. Hot Weather per ACI SPEC-305.1:
  - 1. Cool concrete materials before mixing, or add ice in lieu of mix water as necessary to deposit concrete at a temperature below 85°F.
  - 2. Do not place concrete in hot/windy weather without Architect/ Engineer review of procedures.
  - 3. Provide sunshades and/or wind breakers to protect concrete during finishing and immediate curing operations. Do not place slab concrete at air temperature exceeding 90°F.
  - 4. Provide modified mix designs, adding retarders to improve initial set times and applying evaporation reducers during hot/windy weather for review by Independent Testing Agency prior to use.

## 1.7 SCHEDULING AND SEQUENCING

- A. Organize the work and employ shop and field crew(s) of sufficient size to minimize inspections by the Testing Agency.
- B. Provide schedule and sequence information to Testing Agency in writing upon request. Update information as work progresses.

## PART 2 – PRODUCTS

### 2.1 FORMWORK

- A. Comply with requirements of Section 03 1000.

### 2.2 REINFORCEMENT

- A. Comply with requirements of Section 03 2000.

### 2.3 MATERIALS

- A. General Requirements: All materials shall be new and best of their class or kind. All materials found defective, unsuitable, or not as specified, will be condemned and promptly removed from the premises.
- B. Cementitious Materials:
  - 1. Portland Cement: ASTM C150, Type II, low alkali conforming to CBC 1903.1.
  - 2. Fly Ash (Pozzolan): ASTM C618, Class F.
  - 3. Slag Cement: ASTM C989, Grade 100 or 120.
- C. Concrete Aggregates:
  - 1. Coarse and Fine Aggregates: ASTM C33; Stone aggregate and sand. Specific source aggregate and/or sand or shrinkage characteristics as required for class of concrete specified.
  - 2. Source shall remain constant throughout the duration of the job. The exact portions of the fine aggregates and coarse aggregates to be used in the mix shall be determined by the mix design.

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3. Recycled concrete products: Returned plastic concrete may not be used in a mix. Recycled Concrete Aggregate (RCA) is not permitted. Reclaimed coarse aggregate is permitted and shall comply with ASTM C33. Reclaimed fine aggregate is not permitted.
- D. Water: ASTM C1602. Potable, clean, from domestic source.
- E. Admixtures: All admixtures shall be used in strict accordance with the manufacturer's recommendations. Admixtures containing calcium chlorides or other accelerators shall not be used without the approval of the Architect/Engineer and the Owner's Testing Laboratory.
1. Normal or Mid Range Water Reducing Admixtures: ASTM C494 Type A, "MasterPozzolith" series or "MasterPolyheed" series by Master Builders Solutions, "WRDA" series by W.R. Grace, or equal.
  2. Water Reducing Admixture and Retarder: ASTM C494 Type B or D, "MasterSet R" series or "MasterSet DELVO" series by Master Builders Solutions, "Plastiflow-R" by Nox-crete, or equal.
  3. High Range Water-Reducing Admixtures: ASTM C494 Type F, "MasterRheoBuild 1000" or "MasterGlenium" series by Master Builders Solutions or equal.
  4. Air Entraining Admixtures: ASTM C260, "MasterAir" series by Master Builders Solutions or equal.
  5. Viscosity Modifiers: ASTM C494 Type S, "MasterMatrix VMA" series by Master Builders Solutions or equal.
- F. Slurry: Same proportion of cement to fine aggregates used in the regular concrete mix (i.e. only coarse aggregate omitted); well mixed with water to produce a thick consistency.

### 2.4 ACCESSORIES

- A. Bonding Agent: ASTM C881, Type II Grade 2 Class B or C. Do not allow epoxy to set before placing fresh concrete.
1. "MasterEmaco ADH 326" by Master Builders Solutions;
  2. "Rezi-Weld 1000" by W.R. Meadows.
- B. Chemical Hardener: Fluorosilicate solution designed for densification of cured concrete slabs. "MasterKure HD 300 WB" by Master Builders Solutions, "LIQUI-HARD" W.R. Meadows Co, or equal.
- C. Moisture-Retaining Cover: ASTM C171, type 1, one of the following;
1. Regular Curing Paper, Type I, reinforced waterproof: Fortifiber Corporation "Orange Label Sisalkraft", "Pabcotite" paper, or equal.
  2. Polyethylene Film: ASTM D 2103, 4 mil thick, clear or white color.
  3. White-burlap-polyethylene sheet, weighing not less than 10 oz/per linear yd.
- D. Liquid Curing Compound: ASTM C 309, Type 1, Class B, clear or translucent, 25% minimum solids, water base acrylic cure/sealer which will not discolor concrete and compatible with bonding of finishes specified in related sections. W.R. Meadows Co. "Vocomp 25" or equal. Maximum VOC content shall comply with local requirements and California Green Building Code.
- E. Under Slab Water Vapor Retarder: Vapor retarder sheet to be ASTM E1745 Class A; 15 mil, single ply extruded polyolefin; permeance no greater than 0.01 U.S. Perms per ASTM E154, ASTM E96 procedure B or ASTM F1249.

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1. "Stego Wrap Vapor Barrier (15mil)" by Stego Industries LLC.
2. "Vaporguard" by Reef Industries.
3. Approved Equal.

F. Evaporation Reducer: "MasterKure ER 50", by Master Builders Solutions.

G. Permeability Reducer: Use only where specifically referred to.

1. ASTM C494 Type S.
2. Admixture Type: Xypex Chemical Corporation "XYPEX Admix C-500", Master Builders Solutions "MasterLife 300" series. Dosage: per manufacturer.
3. Surface-Applied Type: Xypex Chemical Corporation "XYPEX Concentrate. Brush application: 1.25-1.50lb/sq. yd., 5 parts powder to 2 parts water. Master Builders Solutions "MasterSeal 500". Slurry coat: one part water to 2.25-2.5 parts powder by volume.
4. Approved equal.

### 2.5 JOINT DEVICES AND MATERIALS

A. Expansion Joint Filler: ASTM D1751, Nonextruding, resilient asphalt impregnated fiberboard or felt, 3/8 inch thick and 4 inches deep; tongue and groove profile.

1. Products: "Serviced Products", W.R. Meadows, Inc., "National Expansion Joint Company", "Celotex Corporation", or equal.

B. Joint Filler: ASTM D944, Compressible asphalt mastic with felt facers, 1/4 inch thick and 4 inches deep.

C. Sealant and Primer: As specified in Section 07 9000.

D. Slab Joint Sealant: Compatible with floor finishes specified in related sections.

### 2.6 CONCRETE MIXES

A. General requirements for mix design and submittal of structural class concrete:

1. Provide Contractor submittals to Architect/Engineer not less than 15 days before placing concrete.
2. Contractor shall review mix designs and proposed placing requirements prior to submittal for compatibility to ensure that the concrete as designed can be placed in accordance with the drawings and specifications.
3. Changes or revisions require re-submittal: All variations to approved mix designs, including changing type and/or quantity of admixtures shall be resubmitted to the Architect/Engineer for review prior to use.
4. Mix design(s) for all structural classes of concrete to be prepared by qualified person experienced in mix design. Allow for time necessary to do trial batch testing when required.
5. Preparer to provide backup data and certify in writing that mix design meets:
  - a. Requirements of the specifications for concrete durability and quality;
  - b. Requirements of the California Building Code and ACI CODE-318, including break histories, trial batching test results, and/or a mix designed by a California Registered Civil Engineer per ACI CODE-318 and bearing the Engineer's seal & signature.
6. Clearly note on mix designs with specified maximum W/CM if design permits addition of water on site, or clearly identify in the mix design that no water is to be added on site.

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7. Deviations: Clearly indicate proposed deviations, and provide written explanation explaining how the deviating mix design(s) will provide equivalent or better concrete product(s) than those specified.
  8. Include adjustments to reviewed mix designs to account for weather conditions and similar factors.
- B. Proportioning - General: The following provisions apply to all mix designs:
1. Proportion concrete mixes to produce concrete of required average strength (as defined by ACI CODE-318). Select slump, aggregate sizes, shrinkage, and consistency that will allow thorough compaction without excessive puddling, spading, or vibration, and without permitting the materials to segregate, or allow free water to collect on the surface.
  2. Select aggregate size and type to produce dense, uniform concrete with low to moderate shrinkage, free from rock pockets, honeycomb and other irregularities.
  3. Mix designs may include water reducing and retarding admixtures to meet or exceed minimum set times (time required to place and finish) and to minimize Water-Cementitious Materials (W/CM). Minimum and maximum criteria presented in this section are guidelines and do not represent a specific mix design.
  4. Cement Content: Minimum cement content indicates minimum sacks of cementitious material. Increasing cement content to increase early strengths or to achieve specified W/CM while maintaining water content is discouraged in order to minimize effects of shrinkage.
    - a. Substitution of fly ash for Portland cement on an equivalent weight basis up to 25% replacement is permitted, except at high early strength concrete. Replacement in excess of 25% is not permitted unless part of a specified mix design that has been submitted for review.
    - b. Substitution of slag cement for Portland cement on an equivalent weight basis up to 45% replacement is permitted, except at high early strength concrete. Replacement in excess of 45% is not permitted unless part of a specified mix design that has been submitted for review.
    - c. Such substitution requests may be denied by the Engineer.
  5. Water Content: Mix designs with a specified maximum W/CM may be designed with a lower WCR than specified in order to allow addition of water at the site.
  6. Concrete Strength: Establish required average strength for each type of concrete on the basis of field experience or trial mixtures, as specified in ACI SPEC-301 and this section.
    - a. For trial mixtures method, employ independent testing agency acceptable to Architect/Engineer for preparing and reporting proposed mix designs.
  7. Placement Options: Mix designs may, at the Contractor's option, be designed for either pump or conventional placement with aggregate size, slumps, etc. to be maintained as specified in this section.
- C. Proportioning Normal Weight Concrete: Comply with ACI PRC-211.1 recommendations and this section.
- D. Special mix design requirements for interior concrete floor slabs-on-ground:
1. Proportion concrete mixes per this specification, ACI PRC-211.1, and the requirements below:
  2. Fly Ash, shall be substituted for cement on a 1 lb. per 1 lb. basis, with a minimum replacement of 25% and a maximum of 35%. Alternatively, slag cement, shall be substituted for cement on a 1 lb. per 1 lb. basis, with a minimum replacement of 30% and a maximum of 45%.
  3. 200 lbs. of 3/8(-) aggregate shall be added to reduce total sand.
  4. Reduce total sand to minimum practical.

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5. Admixture dosage shall be per manufacturer's recommendations. Dosage may be increased for workability as long as set times are not excessive for placement and finishing.

E. Mix Design Minimum Requirements:

Concrete Class	Coarse Aggregate Size (Inches) & Fine Aggregate <sup>3</sup>	Maximum W/CM or Maximum Nominal Slump & Tolerance (Inches) <sup>1,2</sup>	Minimum 28-Day Design Strength	Minimum Cement Sacks/per yd <sup>4</sup>
<b>NON-STRUCTURAL</b>				
1) Lean Concrete (use only where specified)	---	---	---	3.0
2) Exterior Slab on Ground (Walkways & Patios)	1" x #4	W/CM = .55	2,500	4.5
<b>STRUCTURAL</b>				
3) Interior Slab on Ground <sup>5</sup>	1" x #4	W/CM = .45	3,000	6.1
4) Foundation (including continuous footings, pad footings, stem walls)	1" x #4	W/CM = .53	3,000	5.0

1. The tolerance is the maximum deviation allowable without rejection. The mix design shall be based on the nominal value specified and is without water reducing mixtures. Slump to be measured at the end of the hose.
2. The maximum W/CM is limited at time of placement as noted. No water is to be added on site such that the specified W/CM or maximum slump is exceeded without approval of the testing laboratory and the Architect/Engineer. Workability is to be achieved utilizing an acceptable mid range to high range water reducing admixture.
3. Gradation of aggregate is per ACI CODE-318 and ASTM C33.
4. Minimum cement content includes all cementitious materials.
5. See Article 2.6E for additional requirements at interior slabs on ground.

### 2.7 MIXING CONCRETE

- A. Batch final proportions in accordance with approved mix designs. All adjustments to approved proportions, for whatever reason, shall be reviewed by the Architect/Engineer prior to use.
- B. Batch and mix concrete in accordance with ASTM C94, at an established plant. Site mixed concrete will be rejected.
- C. Provide batch and transit equipment adequate for the work. Operate as necessary to provide concrete complying with specified requirements.
- D. Place mixed concrete in forms within 1-1/2 hours from the time of introduction of cement and water into mixer or 300 revolutions of the drum whichever comes first. Use of, re-mixing, and/or tempering mixed concrete older than 1 hour will not be permitted.
- E. Do not add water at the site to concrete mixes with a maximum specified W/CM unless the water content at batch time provides for a W/CM less than specified and this provision, including the quantity of water which may be added at the site, is specifically noted on the mix design and certification by the mix preparer. See ASTM C94 for additional requirements.

### 2.8 SOURCE QUALITY CONTROL

- A. Services by independent Testing Agency:

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1. Batch Plant Certificates: Obtain the weighmaster's Batch Plant Certificate at arrival of truck at the site. If no batch plant certificate is provided, recommend to the General Contractor that the truckload of concrete be rejected. So note in daily log, along with the location of the load of concrete in the structure if the load is not rejected.
  - a. Laboratory's inspector shall obtain for each transit mixer Batch Plant Certificates to verify mix design quantities and condition upon delivery to the site.
  - b. Certificates to include: Date, time, ingredient quantities, water added at plant and on job, total mixer revolutions at time of placement, and time of departure.
  - c. Concrete with specified water cement ratio: Add no water on site unless mix design and batch records each show additional water may be added. See ASTM C94 for additional requirements.

## PART 3 - EXECUTION

### 3.1 EXAMINATION

- A. Verify lines, levels, and dimensions before proceeding with work of this section.
- B. Verify work of other sections is complete and tested as required before proceeding.

### 3.2 PREPARATION

- A. Observation, Inspection and Testing:
  1. Architect/Engineer: Notify not less than 2 working days before each concrete placement, for observation and review of reinforcing, forms, and other work prior to placement of concrete.
  2. Testing Agency: Notify not less than 24 hours before each placement for inspection and testing.
- B. Placement Records: Contractor shall maintain records of time, temperature and date of concrete placement including mix design and location in the structure. Retain records until completion of the contract. Make available for review by Testing Agency and Architect/Engineer.
- C. Coordinate placement of joint devices with erection of concrete formwork and placement of form accessories.
- D. Verify location, position and inclusion of all embedded and concealed items.
- E. Verify installation of vapor retarder under interior slabs on ground, as specified in related section, is complete.
- F. Cleaning and Preparation:
  1. Remove loose dirt, mud, standing water, and foreign matter from excavations and cavities.
  2. Close cleanout and inspection ports securely.
  3. Thoroughly clean reinforcement and other embedded items free from loose rust and foreign matter. Maintain reinforcing securely in place. Do not place concrete on hot reinforcing.
  4. At cold joints, remove laitance from previously placed concrete surface.
  5. Dampen form materials and substrates on which concrete is to be placed at least 1 hour in advance of placing concrete; repeat wetting as necessary to keep surfaces damp. Do not saturate. Do not place concrete on saturated material.

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- a. Thoroughly wet wood forms (except coated plywood), bottom and sides of trenches, adjacent concrete or masonry and reinforcement.
  - b. Concrete slabs on base rock, dampen rock.
  - c. Concrete slabs on vapor retarder, do not wet vapor retarder.
  6. Prepare previously placed concrete by cleaning with steel brush and applying bonding agent in accordance with manufacturer's instructions.
- G. Drill holes in existing concrete at locations where new concrete is doveled to existing work. Insert steel dowels and prepare connections as detailed.
- H. Do not overcut at existing concrete work to remain. Contractor is responsible for repair/replacement of overcut concrete to the Owner's satisfaction.

### 3.3 PIPES AND CONDUITS IN CONCRETE

#### A. Slabs-on-Ground:

1. No pipe or conduit exceeding 1 inch outside diameter shall be embedded within the specified slab thickness except as specifically detailed.
2. Do not stack or abut pipes, maintain 3 inches minimum clearance.

#### B. Sleeving and Wrapping:

1. Foundations: Sleeve or wrap all individual pipe penetrations, minimum 1-1/2 inches clear to reinforcing all around.
  - a. Sleeves: PVC. Provide 1 inch minimum clear all around O.D. pipe to I.D sleeve, UNO at ends, fill void space with mastic or plastic bituminous cement.
  - b. Wrapped Vertical Pipes: Provide 1/8 inch nominal sheet foam with three wraps minimum, UNO.
  - c. Wrapped Horizontal Pipes: Provide 1/8 inch nominal sheet foam with eight wraps minimum, UNO.
  - d. Underground Fire Lines 4" and Larger: At sleeves provide 2 inch minimum clear all around O.D. pipe to I.D sleeve. At wrapped pipes, provide 1/8 inch nominal sheet foam with sixteen wraps minimum.
2. Slabs or Curbs: Wrap pipes as described above.

#### C. Space groups of pipes/conduits at least 3 sleeve diameters apart, do not interrupt specified concrete and reinforcement.

1. Provide block-outs as detailed when grouping of pipes/conduits in foundation or other structural member prevents spacing as described. Notify Architect/Engineer for review of any conditions not conforming to details.
2. Center pipe/conduit penetrations in the depth and/or thickness of foundations.
3. Maximum size of pipe/conduit penetrations shall not exceed the least dimension of concrete divided by 3.

### 3.4 CONCRETE PLACEMENT

#### A. Transporting:

1. Provide clean, well-maintained equipment of sufficient quantity and capacity to execute the work and produce concrete of quality specified.
2. Handle and transport concrete from mixer to final deposit location as rapidly as practicable. Prevent separation or loss of ingredients.

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- B. Perform concrete placement by methods which will not puncture, damage or disturb vapor retarder membrane. Repair all damage to vapor retarder membrane before covering.
  
- C. Placement - General: Placement, once started, shall be carried on as a continuous operation until section of approved size and shape is completed. Provide construction joints as detailed on the drawings. Engineer's written approval required for all deviations.
  - 1. Deposition:
    - a. Deposit concrete to maintain an approximately horizontal plastic surface until the completion of the unit placement.
    - b. Deposit as neatly as practicable in final position, minimize re-handling or flow.
    - c. Do not drop concrete freely where reinforcing bars, embeds, or obstructions occur that may cause segregation. Provide spouts, elephant trunks, or other means to prevent segregation during placement.
  - 2. Progress Cleaning: Remove all concrete spilled on forms or reinforcing steel in portions of structure not immediately concreted. Remove completely before concrete sets.
  - 3. Interruptions: Shut down placement operations and dispose of all remaining mixed concrete and concrete in hoppers or mixers following all interruption in placement longer than 60 minutes.
    - a. If such interruption occurs, provide new or relocate existing construction joints as directed by Engineer.
    - b. Cut concrete back to the designated line, cleaning forms and reinforcing as herein specified.
    - c. Prepare for resumption of placement as for new unit when reason for interruption is resolved.
  
- D. Consolidation:
  - 1. Consolidate all concrete thoroughly during placement with high-speed mechanical vibrators and other suitable tools. Perform manual spading and tamping to work around reinforcement, embedded fixtures, and into corners of formwork as required to obtain thorough compaction.
    - a. Provide vibrators with sufficient amplitude for adequate consolidation.
    - b. Use mechanical vibrators at each point of concrete placement.
    - c. Keep additional spare vibrators, in addition to those required for use, at the site for standby service in case of equipment failure.
  - 2. Consolidate each layer of concrete as placed.
    - a. Insert vibrators vertically at points 18 to 30 inches apart; work into top area of previously placed layer to reconsolidate, slowly withdraw vibrator to surface.
    - b. Avoid contact of vibrator heads with formwork surfaces.
    - c. Systematically double back and reconsolidate wherever possible. Consolidate as required to provide concrete of maximum density with minimized honeycomb.
  
- E. Unacceptable Materials:
  - 1. Do not place concrete that has started to set or stiffen. Dispose of these materials.
  - 2. Do not add water on site to concrete except as specified in the approved mix design, see PART 2 above.
  
- F. Protection of installed work:
  - 1. Do not introduce any foreign material into any specified drainage, piping or duct systems.
  - 2. Contractor shall bear all costs of work required to repair or clean affected work as a result of failure to comply with this requirement.



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### 3.5 CONCRETE JOINTS

#### A. Structural Joints (Construction/Cold Joints):

1. Locate joints only where shown, or as approved.
2. Review Required: Joints not indicated on the plans shall be located to meet the minimum requirements below, shall not impair the strength of the structure and shall be submitted to Architect/Engineer for review prior to placement of concrete.
  - a. Indicate proposed location(s) of construction/cold/expansion joints on shop drawing submittals for review prior to placing concrete.
3. Clean and roughen all surfaces of previously placed concrete at construction joints by washing and sandblasting to expose aggregate to 1/4 inch amplitude.
4. Slabs-On-Ground: Maximum Length of continuous placement shall not exceed 60 feet without special review by the Architect/Engineer. Alternate or stagger placement sections.
5. Foundations: Maximum Length of continuous placement shall not exceed 200 foot increments. Provide "keyed" shut-off locations made up with form boards. Extend reinforcing one lap length or more through shut-off.
  - a. All reinforcement shall be continuous through construction/cold joint, lapping to adjacent reinforcing in future placement.

#### B. Expansion/Construction Joints (Dowel Joints and Control Joints):

1. Interior and Exterior Slabs-on-Ground:
  - a. Expansion/Construction Joints: Provide dowel joints or control joints at a maximum dimension (in feet) of three times the slab thickness (in inches) in each direction unless noted otherwise (15'-0" maximum). Install joints to match slab level and in straight lines. Locate joints at all reentrant corners including blockouts.
  - b. Proportions: Install joints to divide slab into rectangular areas with long dimensions less than 1.5 times short dimension.
2. Exterior Concrete Slabs-on-Ground (walkways, patios):
  - a. Expansion/ construction joints: Provide a 2 inch deep troweled groove or asphalt impregnated joint material embedded 50 percent of the slab depth at 12 feet on center, maximum.
  - b. Proportions: Place no section with a length larger than two times width. Additionally, place joints at all inside corners and at all intersections with other work.

#### C. Joint Types:

1. Dowel Joint: A keyed joint with smooth dowels passing through to allow unrestricted movement due to contraction and expansion. Joints are as specified on the drawings.
2. Control Joint(s): Shrinkage crack control joints may be of the following types when shown on the drawings. Install joints in a straight line between end points with edges finished appropriate to type. Depth shall be 25% of the slab thickness, unless noted otherwise. Fill joints with sealant as shown on the drawings or as required by related sections.
  - a. 1/4 inch wide troweled joint.
  - b. Keyed joint: Only at locations where concealed by other finishes.
  - c. Masonite Strip, 1/8 inch: Only at locations where concealed by other finishes.
  - d. Saw Cut, 1/8 inch: Must be performed within eight hours of completion of finishing. Do not make saw cuts if aggregate separates from cement paste during cutting operation. Prevent marring of surface finish. Fill with flexible sealant.

### 3.6 VAPOR RETARDER

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- A. Vapor Retarder Installation: Install as specified in PART 2, ASTM E1643, and per manufacturer's recommendations including taping and lapping of seams, sealing of penetrations, and repair of damage. Do not extend vapor retarder below footings.

### 3.7 FLATWORK

- A. General Requirements for All Concrete Formed & Finished Flat:
  - 1. Edge Forms and Screeds: Set accurately to produce indicated design elevations and contours in the finished surface, edge forms sufficiently strong to support screed type proposed.
  - 2. Jointing: Located and detailed as indicated.
  - 3. Consolidation: Concrete in slabs shall be thoroughly consolidated.
- B. Flatwork Schedule:
  - 1. Exterior Slabs-On- Ground: Place concrete directly over sub-base as indicated.
    - a. Sub-Base: Clean free-draining, crushed base rock, 4 inch minimum thickness, thoroughly compacted.
  - 2. Interior Concrete Slabs-On- Ground:
    - a. Sub-Base: Clean free-draining, crushed base rock, 4 inch minimum thickness, thoroughly compacted.
    - b. Vapor Retarder: Install over sub-base.

### 3.8 FORMED SURFACES

- A. Form all concrete members level and plumb, except as specifically indicated. Comply with tolerances specified in ACI CODE-318, ACI SPEC-301, and this specification, except that maximum permissible deviation is 1/4 inch end-to-end for any single member.

### 3.9 CONCRETE FINISHES

- A. Flatwork Finishing:
  - 1. Perform with experienced operators.
  - 2. Finish surfaces monolithically. Establish uniform slopes or level grades as indicated. Maintain full design thickness.
  - 3. In areas with floor drains, maintain design floor elevation at walls; slope surfaces uniformly to drains as indicated on drawings.
  - 4. Flatwork Finish Types:
    - a. Wood Float Finish: Surfaces to receive quarry tile, ceramic tile, or cementitious terrazzo with full bed setting system, or wood frame for raised finished floors.
    - b. Steel Trowel Finish: Surfaces to receive carpeting, resilient flooring, seamless flooring, thin set terrazzo, thin set tile or similar finishes specified in related sections. Trowel twice, minimum.
    - c. Broom Texture Finish: Exterior surfaces as indicated or for which no other finish is indicated. Finish as for steel trowel finish, except immediately following first troweling, (depending on conditions of concrete and nature of finish required) provide uniform surfaces texture using a medium or coarse fiber broom.
- B. Other Concrete: Provide as required to achieve appearance indicated on structural and architectural drawings and related sections.
  - 1. Repair surface defects, including tie holes, immediately after removing formwork.

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2. Unexposed Form Finish: Rub down or chip off fins or other raised areas 1/4 inch or more in height.
3. Exposed Form Finish: Finish concrete to match forms. Rub down or chip off and smooth fins or other raised areas 1/4 inch or more in height. Provide finish as follows:
  - a. Smooth Rubbed Finish: Wet concrete and rub with carborundum brick or other abrasive, not more than 24 hours after form removal.
  - b. Grout Cleaned Finish: Wet areas to be cleaned and apply grout mixture by brush or spray; scrub immediately to remove excess grout. After drying, rub vigorously with clean burlap, and keep moist for 36 hours.
  - c. Cork Floated Finish: Immediately after form removal, apply grout with trowel or firm rubber float; compress grout with low-speed grinder, and apply final texture with cork float.
4. Intermediate joint and score marks and edges: Tool smooth and flush unless otherwise indicated or as directed by the Architect.
5. Use steel tools of standard patterns and as required to achieve details shown or specified. All exposed corners not specified to be chamfered shall have radiused edges.

### 3.10 TOLERANCES

- A. Minimum Flatwork Tolerances: Measure flatness of slabs within 48 hours after slab installation in accordance with ACI PRC-302.1 and ASTM E1155 and to achieve the following FF and FL tolerances:
  1. Exterior surfaces: 1/8 inch minimum per foot where sloped to drain. Level otherwise. FF20 and FL15.
  2. Interior surfaces not otherwise shown or required: Level throughout. FF25 and FL20
  3. Interior surfaces required to be sloped for drainage: 1/8 inch in 10 ft.
  4. Finish concrete to achieve the following tolerances:
    - a. Under Glazed Tile on Setting Bed: FF30 and FL20.
    - b. Under Resilient Finishes: FF35 and FL25.
    - c. Flooring manufacturer and pertinent section of Division 9.
- B. Formed Surface Tolerances:
  1. Permanently Exposed Joints and Surfaces: Provide maximum differential height within two feet of, and across construction joints of 1/16 inch.
  2. Vertical Elevations: Elevation of surfaces shall be as shown or approved.

### 3.11 SEPARATE FLOOR TOPPING

- A. Prior to placing floor topping, roughen substrate concrete surface and remove deleterious material. Broom and vacuum clean.
- B. Place required dividers, edge strips, reinforcing, and other items to be cast in.
- C. Apply bonding agent to substrate in accordance with manufacturer's instructions.
- D. Apply sand and cement slurry coat on base course, immediately prior to placing toppings.
- E. Place concrete floor toppings to required lines and levels. Place topping in checkerboard panels not to exceed 20 feet in either direction.
- F. Scream toppings level, maintaining surface tolerances per above.

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## 3.12 CONCRETE CURING

- A. Curing - General: Cure in accordance with ACI SPEC-308.1. Maintain concrete water content for proper hydration and minimize temperature variations. Begin curing immediately following finishing.
- B. Protection During Curing: Immediately after placement, protect concrete from premature drying, excessively hot or cold temperatures, and mechanical injury. The General Contractor is responsible for the protection of the finished slab from damage.
  - 1. Avoid foot traffic on concrete for minimum of 24-hours after placement.
  - 2. Protect concrete from sun and rain.
  - 3. Maintain concrete temperature at or above 50 degrees F. during the first 7 days after placement. See Article ENVIRONMENTAL REQUIREMENTS.
  - 4. Do not subject concrete to design loads until concrete is completely cured, and until concrete has attained its full specified 28-day compressive strength or until 21 days after placement, whichever is longer.
  - 5. Protect concrete during and after curing from damage during subsequent building construction operations. See Article PROTECTION.
- C. Maintain concrete with minimal moisture loss at relatively constant temperature for period necessary for hydration of cement and hardening of concrete.
  - 1. Normal concrete: Not less than 7 days.
- D. Begin curing immediately following finishing.
- E. Surfaces Not in Contact with Forms:
  - 1. Start initial curing as soon as free water has disappeared and before surface is dry. Keep continuously moist for not less than 3 days by water ponding, water-saturated sand, water-fog spray, or saturated burlap.
  - 2. Begin final curing after initial curing but before surface is dry.
    - a. Moisture-retaining cover: Seal in place with waterproof tape or adhesive.
    - b. Curing compound: Apply in two coats at right angles, using application rate recommended by manufacturer.
  - 3. In addition, see specific conditions noted below.
- F. Slabs on Ground: Cure by one of the following methods:
  - 1. Water Cure (Ponding): Maintain 100 percent coverage of water over floor slab areas, continuously for minimum 7 calendar days.
  - 2. Spraying: Spray water over floor slab areas and maintain wet for 7 days.
  - 3. Moisture-Retaining Film or Paper: Lap strips not less than 6 inches and seal with waterproof tape or adhesive; extend beyond slab or paving perimeters minimum 6 inches and secure at edges; maintain in place for minimum 7 days.
  - 4. Absorptive Moisture-Retaining Covering: Saturate burlap-polyethylene and place burlap-side down over floor slab areas, lapping ends and sides and extend beyond slab or paving perimeters 6 inches minimum; maintain in place for minimum 7 days.
  - 5. Liquid Membrane-forming Curing Compound: Provide only when subsequent concrete treatments or finish flooring specified in related sections will not be affected by cure/sealer. Apply curing compound in accordance with manufacturer's instructions at the maximum recommended application rate in two coats, with second coat applied at right angles to first.

# EXHIBIT C

## Cast-in-place Concrete Section 03 3000

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- G. Foundations: Apply curing compound immediately after floating.

### 3.13 CONCRETE HARDENER

- A. Apply hardener to all floor slabs not receiving other finishes after 30 days minimum curing. Clean slabs of non-compatible cure/sealers or other foreign material(s) and apply in strict accordance with the manufacturer's directions.

### 3.14 FIELD QUALITY CONTROL

- A. Testing and Inspections by Independent Testing Agency: Provided verification and inspection of concrete per CBC Table 1705.3. Provide written reports for to Engineer, Architect, Contractor and Building Official for the following tests and inspections:
- B. Testing & Inspection: Provide periodic inspection of reinforcing steel. Provide continuous inspection during placement of structural class concrete, 3000 psi or more. Non-structural class concrete with a design strength of 2500 psi or less to have periodic inspection on a 150 cubic yard basis as required to assure conformance.
1. Provide periodic inspection of bolts in concrete prior to and during placement where so noted on the construction documents.
  2. Structural Concrete Cylinder Tests: Form in accordance with ASTM C31.
    - a. Take four standard 6 inch x 12 inch (or five 4 inch x 8 inch) cylinder specimens on the site, of each class of concrete as specified in PART 2, not less than once a day or for each 150 cubic yards or 5000 sq ft or fraction thereof placed each day.
    - b. Record the location of each concrete batch in the building in a log and also note on each specimen.
    - c. Perform standard compression test of cylinders in accordance with ASTM C39, one at 7 days and two (three for 4x8 cylinders) at 28 days.
    - d. Hold fourth (fifth) cylinder untested until specified concrete strengths are attained.
  3. Structural Concrete Slump Test and Air Tests: Perform slump in accordance with ASTM C143 and air content in accordance with C231 or C173 at the time of taking test cylinders, and/or at one-hour intervals during concrete placing.
  4. Measure and record concrete temperature in accordance with ASTM C1064 upon arrival of transit mixers and when taking specimens. Note weather conditions and temperature.
  5. Determine concrete density in accordance with ASTM C138 at the time of forming test cylinders.
  6. Propose adjustments to reviewed mix designs for Architect / Engineer review to account for variations in site or weather conditions, or other factors as appropriate.
  7. Water Vapor Transmission Tests: Floors receiving floor finishes specified in related sections will be tested prior to installation of flooring systems. Refer to sections specifying floor finishes for related requirements.
- C. Services by Contractor:
1. Rejection of Concrete Materials: Do not use the following without prior written approval of the Architect/Engineer;
    - a. Materials without batch plant certificates.
    - b. Materials not conforming to the requirements of these specifications.

### 3.15 ADJUSTING

- A. Inspect all concrete surfaces immediately upon formwork removal. Notify Architect/Engineer of identified minor defects. Repair all minor defects as directed.

# EXHIBIT C

## Cast-in-place Concrete Section 03 3000

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- B. Surface and Finish Defects: Repair as directed by the Architect/Engineer, at no added expense to the Owner. Repairs include all necessary materials; reinforcement grouts, dry pack, admixtures, epoxy and aggregates to perform required repair.
  - 1. Repair minor defective surface defects by use of drypack and surface grinding. Specific written approval of Architect/Engineer is required. Submit proposed patching mixture and methods for approval prior to commencing work.
  - 2. Slabs-on- Ground: Review for "curled" slab edges and shrinkage cracks prior to installation of other floor finishes. Grind curled edges flush, fill cracks of 1/16 inch and greater with cementitious grout.
  - 3. Grind high spots, fins or protrusions caused by formwork; Fill-in pour joints, voids, rock pockets, tie holes and other void not impairing structural strength. Provide surfaces flush with surrounding concrete.

### 3.16 DEFECTIVE CONCRETE

- A. Defective Concrete: Concrete not conforming to required compressive strength, lines, details, dimensions, tolerances, finishes or specified requirements; as determined by the Architect/Engineer.
- B. Repair or replacement of defective concrete will be determined by the Architect/Engineer who may order additional testing and inspection at his option. The cost of additional testing shall be borne by Contractor when defective concrete is identified.
- C. Specific Defects:
  - 1. "Low-Strength"; Concrete Not Meeting Specified Compressive Strength after 28 days:
    - a. Concrete with less than 25% Fly Ash or 35% Slag as cementitious material: Test remaining cylinder(s) at 56 days. If strength requirements are met, concrete strength is acceptable.
    - b. Concrete with 25% or more Fly Ash or 35% or more Slag as cementitious material: Test remaining cylinder(s) at 70 days. If strength requirements are met, concrete strength is acceptable.
  - 2. Excessive Shrinkage, Cracking, Cracking or Curling; Defective Finish: Remove and replace if repair to acceptable condition is not feasible.
  - 3. Lines, Details, Dimensions, Tolerances: Remove and replace if repair to acceptable condition is not feasible.
  - 4. Slab sections not meeting specified tolerances for trueness/flatness or lines/levels: Remove and replace unless otherwise directed by the Architect/Engineer. Minimum area for removal: Fifteen square feet area unless directed otherwise by the Architect/Engineer.
  - 5. Defective work affecting the strength of the structure or the appearance: Complete removal and replacement of defective concrete, as directed by the Architect/Engineer.

### 3.17 CLEANING

- A. Maintain site free of debris and rubbish. Remove all materials and apparatus from the premises and streets at completion of work. Remove all drippings; leave the entire work clean and free of debris.
- B. Slabs to Receive Floor Finishes Specified in other sections: Remove non-compatible cure/sealers or other foreign material(s) which may affect bonding of subsequent finishes. Leave in condition to receive work of related sections.

### 3.18 PROTECTION

- A. Protect completed work from damage until project is complete and accepted by Owner.

# EXHIBIT C

Cast-in-place Concrete Section 03 3000

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- B. Construction Loads: Submit engineering analysis for equipment loads (including all carried loads) specified in article submittals.
- C. Keep finished areas free from all equipment traffic for a minimum of 4 additional days following attainment of design strength and completion of curing.
- D. Protection of Drainage Systems:
  - 1. Care shall be taken not to introduce any foreign material into any specified drainage, piping or duct system.
  - 2. Cost of work to repair or clean drainage system as a result of failure to comply with this requirement will be back charged to the contractor.
- E. Cover traffic areas with plywood sheets or other protective devices; maintain protection in place and in good repair for as long as necessary to protect against damage by subsequent construction operations.

END OF SECTION

# EXHIBIT C

Miscellaneous Metal Fabrications Section 05 5000

## MISCELLANEOUS METAL FABRICATIONS SECTION 05 5000

### PART 1-GENERAL

#### 1.1 SUMMARY

- A. Description: Provide Miscellaneous Metal Fabrications, as shown and specified per Contract documents.

#### 1.2 SUBMITTALS

- A. General: Refer to GENERAL CONDITIONS.
- B. Shop Drawings: Submit manufacture and installation details, including fastenings, for review.
- C. Samples: If specifically requested.
- D. Product Data: Submit manufacturer's specifications, data, and installation instructions for review.
- E. Closeout:
  - 1. General: Refer to GENERAL CONDITIONS.
  - 2. Maintenance Data: Manufacturer's instructions.
  - 3. Guarantee: provide in required form for a period of one (1) year from date of final acceptance by Owner.

#### 1.3 QUALITY ASSURANCE

- A. General: Refer to GENERAL CONDITIONS.
- B. Reference Standards:
  - 1. General: Refer to GENERAL CONDITIONS for reference standards, applicable codes and definitions.
  - 2. American Institute for Steel Construction (AISC):
    - a. AISC ASD Manual: Specification for Structural Steel Building—Allowable Stress Design and Plastic Design.
    - b. AISC ASD/LRFD: Manual of Steel Construction Volume II – Connections.
    - c. AISC LRFD Volume I and II: Manual of Steel Construction Load and Resistance Factor Design, Volume I: Structural Members, Specifications and Codes.
    - d. AISC S303: Code of Standard Practice for Steel Buildings and Bridges.
  - 3. American Society of Testing Materials (ASTM): Materials and testing standards as identified throughout this Section.



# EXHIBIT C

## Miscellaneous Metal Fabrications Section 05 5000

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4. American Welding Society (AWS):
    - a. AWS D1.1 Structural Welding Code – steel.
    - b. AWS D1.3: Structural Welding Code – sheet steel.
  5. National Association of Architectural Metal Manufacturers (NAAMM): Standards.
  6. Steel Structures Painting Counsel (SSPC): Painting Manual.
- C. Qualifications:
1. General: Fabricator and installer specializing in the work of this Section with minimum three (3) years documented experience.
  2. Welding: Performed by certified welders per AWS.

## PART 2- PRODUCTS

### 2.1 MATERIALS

- A. General: Refer to GENERAL CONDITIONS
- B. Steel Shapes:
  1. General: ASTM A36.
  2. Steel Tubing: ASTM A500, Grade B.
  3. Steel Pipe: ASTM A35, Type E or S, Grade B.
  4. Steel Sections: ASTM A36
- C. Fastenings:
  1. General: Bolts, nuts, screws, washers, and other various fastenings necessary for proper erection of work. Galvanized steel fastenings or other non-rusting types for exterior steel work.
  2. Exposed in Finished Surface: Tamperproof countersunk Phillips flat head screws, unless otherwise shown; finish to match adjacent surfaces.
  3. Plastic Screw Anchors:
    - a. General: Type PSA, manufactured by Hilti, Inc.
    - b. Alternate Manufacturers: Comparable products manufactured by Star Anchors and Specialty Fasteners, Inc., or accepted equal.
  4. Drilled-in Concrete Anchors:
    - a. General: Kwik Bolt II manufactured by Hilti Corp.; stainless or galvanized for exterior work.
    - b. Alternate Manufacturers: Comparable products manufactured by ITW Ramset/ Red Head, or acceptable equal.

# EXHIBIT C

## Miscellaneous Metal Fabrications Section 05 5000

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### D. Galvanizing:

1. General: Hot-dip process per ASTM A123 or A153, as applicable. Minimum coating: 2 oz. per square foot.
2. Repair treatment:
  - a. Rod: Per ASTM A780.
  - b. Coating: Per MIL-P-46105.

### E. Plastic Cement: FS SS-C-153, Type 1.

### F. Non-Shrink Grout:

1. General: "Embeco 636" manufactured by Master Builders, inc.
2. Alternate manufacturers: Comparable products manufactured by W.R. Meadows, Inc, or accepted equal.

### G. Primer: Per Section 09 3000 – PAINTING AND COATINGS.

## 2.2 FABRICATION

### A. Workmanship:

1. General: Shop assemble work in largest practical sections; minimize field connections. Grind smooth parts exposed to view; remove weld marks and leave free of fabrication marks. Miter corners and edges unless otherwise shown. Make members true to length so assembling may be done without fillers. Bend, twist, open joints in finished members, or projecting edges or corners at connections will not be permitted. Miter, cope, and block carefully to produce tight hairline joints. Provide lugs, clips, connections, bolts, and fastenings necessary to complete fabrication.
2. Exposed Steel: Comply with ASIC Architecturally Exposed Structural Steel fabrication requirements.
3. Galvanizing: Treat all areas burned off or damaged during fabrication with specified repair compound.
4. Reinforcement: Provide proper reinforcement for hardware, and other fabricated metal work, as required.
5. Welding: Use sequence welding to minimize distortion and heat stresses. Weld by shielded electric arc process per AWS. Use continuous welding along entire area of contact, except where spot welding is permitted. Grind all welds smooth on exposed surfaces. Spot welding not permitted on exposed surfaces.
6. Shop Painting: Per SSPC standards.

### B. Fabrications:

1. General: Fabricate the following items, complete as shown.
2. Countertop Supports: Fabricate from steel angles as shown.

# EXHIBIT C

Miscellaneous Metal Fabrications Section 05 5000

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## PART 3- EXECUTION

### 3.1 PERFORMANCE

A. General: Refer to section 01700 – EXECUTION REQUIREMENTS

### 3.2 PREPARATION

- A. Examination: Examine conditions of work in place before beginning work; report defects.
- B. Measurements: Take field measurements; report variance between plan and field dimension.

### 3.3 INSTALLATION

A. Performance:

1. General: Install with workmen skilled in the particular type of work required.
2. Coordination Deliver miscellaneous metal items to be installed in concrete or masonry, complete with all clips, anchors or bolts necessary to secure them in place.
3. Workmanship: Set work plumb and true; properly assemble and erect in a rigid and workmanlike manner. Do cutting, punching, drilling and taping for attachment of other work coming into contact with fabricated metal work where indicated or as directed. Do necessary cutting drilling and fitting for installation of fabricated metal work. Execute drilling, cutting, and fitting carefully; when required, fit work at job before finishing. No burning in field permitted. Replace or repair parts damaged or injured during erection in an acceptable manner. Drill holes for fasteners to exact diameter as recommended by fastener manufacturer. Oversized holes or holes not properly located that produce misalignment of fastener will be rejected.
4. Exposed Steel: Comply with ASIC Architecturally Exposed Structural Steel installation requirements.
5. Galvanizing: Treat areas burned off or damaged during fabrication or erection with specified repair compound.
6. Field Touch-up: Touch-up damaged surfaces and field welds of steel, scheduled to be painted, per SSPC standards.
7. Protection: After erection, provide proper protection for fabricated metal items from other construction operations.

B. Installation:

1. General: Install the metal items, complete as shown.
2. Counter Supports: Anchor to walls and install countertop as shown.

**END OF SECTION 05 5000**

# EXHIBIT C

Rough Carpentry Section 06 1000

## ROUGH CARPENTRY SECTION 06 1000

### PART 1 - GENERAL

#### 1.1 SUMMARY

- A. Section Includes: All labor, materials and equipment and all operations required to complete all rough carpentry and structural framing as indicated on the drawings; to produce shapes and configurations as shown, as required; and as specified herein, including:
1. Structural floor and wall framing.
  2. Floor, wall, and roof sheathing.
  3. Rough hardware, framing connectors and fasteners.
  4. Treatment of wood.
  5. Concealed wood blocking for support of toilet and bath accessories, wall cabinets, wood trim, and other work requiring supporting blocking.
  6. Miscellaneous wood nailers and furring strips, including roof applications, other wood framing, furring, shims or blocking as required to complete the work.
- B. Related Sections:
1. Pertinent sections of Division 01 specifying Quality Control and Testing Agency services.
  2. Pertinent sections of Division 01 specifying Structural Product Requirements: Structural Product Options, Substitution procedures and limitations, transportation, handling and storage.
  3. Pertinent sections of Division 03 specifying wood formwork construction and/or setting anchors in concrete.
  4. Pertinent sections of other divisions specifying steel or concrete construction.

#### 1.2 REFERENCES

- A. California Code of Regulations, Title 24, latest adopted edition (herein noted as CBC): Chapter 23 Wood.
- B. American National Standards Institute (ANSI) / American Wood Council (AWC) "NDS - National Design Specification for Wood Construction".
- C. National Institute of Standards and Technology (NIST) / Engineered Wood Association (APA) "PS 1 - Voluntary Product Standard for Structural Plywood".
- D. NIST / APA "PS 2 - Performance Standard for Wood-Based Structural-Use Panels".
- E. NIST "PS 20 - American Softwood Lumber Standard".
- F. Redwood Inspection Bureau (RIS) "Standard Specifications for Grades of California Redwood Lumber".
- G. West Coast Lumber Inspection Bureau (WCLIB) "Standard Grading Rules for West Coast Lumber No. 17".
- H. Western Wood Products Association (WWPA) "Western Lumber Grading Rules".

# EXHIBIT C

- I. American Wood Preservers Association (AWPA) "Book of Standards".

## 1.3 SUBMITTALS

- A. Submit in accordance with pertinent sections of Division 01 specifying submittal procedures. Submit for review prior to fabrication. Submittals that do not meet these requirements will be returned for correction without review.
  - 1. Substitutions for products specified require conformance to substitution requirements in Division 01.
  - 2. Review of materials and hardware for substitution to products specified is at the additional expense of the Contractor.
- B. Limitation of Review: Structural Engineer's review will be for general conformance with design intent as indicated in the Contract Documents and does not relieve Contractor of full responsibility for conformance with the Contract Documents. The General Contractor shall review and approve shop drawings prior to submittal to the Architect/Engineer.
- C. Product Data:
  - 1. Submit manufacturer's product data, specifications, and installation instructions for & location of framing connectors, wood preservative materials, application instructions, and fasteners. Include complete, accurate equivalence data when submitting alternate products to those specified. Provide samples of these items upon request.
  - 2. Submit product data and current ICC-ES report for machine-driven nails, fasteners, and equipment, including dimensions of all fasteners, including head, shank diameter and length.
- D. Shop drawings: For manufactured wood products, submit each building as a complete unit. Do not mix components from multiple buildings or units of work in a submittal. Include all of the following;
  - 1. Indicate profiles, sizes, and spacing locations of structural members.
  - 2. Cross-reference all shop drawing detail references to contract document detail references.
  - 3. Secure all field measurements as necessary to complete this work.
- E. Manufacturer's Certificate: Submit all certifications of physical and chemical properties of materials as specified below in Article titled QUALITY ASSURANCE.
  - 1. Certify that wood products supplied for rough carpentry meet or exceed specified requirements, including specified moisture content.

## 1.4 QUALITY ASSURANCE

- A. Requirements of Regulatory Agencies, refer to pertinent sections of Division 01 and CBC Chapter 17.
- B. All tests shall be performed by a recognized testing agency as specified in pertinent sections of Division 01.
- C. Inspection of fabricators is required per CBC 1704.2.5 unless fabricator is registered and approved by the building official. Wood product quality standards:

# EXHIBIT C

## Rough Carpentry Section 06 1000

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1. All wood products to comply with article REFERENCES.
2. Factory-mark each piece of lumber and sheathing with type, grade, mill, and grading agency, except omit marking from surfaces to be exposed with transparent finish or without finish.
3. Sheathing panels to be marked by APA (The Engineered Wood Association).

D. End-Jointed lumber shall not be used.

E. Hardware and engineered wood products shall have current ICC ES Evaluation/research reports that are equivalent to products specified.

F. Employ competent workers experienced in work of the types specified and required.

### 1.5 DELIVERY, STORAGE AND HANDLING

A. Comply with pertinent requirements of Division 01.

B. Delivery: Time delivery and installation of carpentry products to avoid delaying other trades whose work is dependent on or affected by this section and to comply with moisture content, protection and storage requirements.

C. Keep materials dry at all times. Protect against exposure to weather and contact with damp or wet surfaces. Stack lumber and sheathing panels to prevent deformation and provide air circulation within stacks.

1. Store materials for which a maximum moisture content is specified only in areas where relative humidity has been reduced to a level where specified moisture content can be maintained.

2. Handle and store materials above ground to prevent damage, contamination, or accumulation of dirt or foreign materials.

3. Provide special protection for horizontal sheathing panels. Deformation of panels due to moisture is not acceptable.

### 1.6 PROJECT/SITE CONDITIONS

A. Verify all conditions at project site affecting the work; work to field dimensions as required. Coordinate carpentry installation with size, location, and installation of service utilities.

B. Sequence rough carpentry installation activities to allow sufficient time for:

1. Review of all submittals.

2. Indicate submittal review, procurement, and testing activities in the project schedule prior to the start of installation. Installation durations shall be based on hand-nailed installation methods specified.

3. Attainment of specified maximum lumber moisture content.

## PART 2 - PRODUCTS

### 2.1 DIMENSIONED LUMBER

A. General

1. Size per industry standards for nominal sizes shown; S4S (sanded four sides).

# EXHIBIT C

## Rough Carpentry Section 06 1000

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2. Warped/twisted and excessively checked members shall not be used regardless of grade marks.
  3. At the Contractor's option, engineered lumber of equivalent size and material properties may be substituted for solid sawn lumber where material is difficult to source due to length, availability, etc. Submit proposed substitution to Engineer for review prior to purchasing materials.
- B. Moisture content of framing:
1. All lumber to be maximum 19% at time of fastener installation. All lumber to be maximum 19% at time of close-in, unless noted otherwise.
  2. The Owner's Testing Laboratory will test for moisture content prior to commencement of close-in.
  3. The Contractor shall recognize that excessive shrinkage of lumber results from excess moisture content at the time of installation. The Contractor will compensate for use of such lumber by waiting for acceptable moisture content before close in and/or by replacing/repairing lumber that has sagged, twisted, or warped prior to close in.
  4. Deviation from this specification would require structural redesign of connections and fasteners.
- C. Sills/ledgers on concrete: No. 2 pressure treated Douglas Fir and as called for on the drawings.
- D. Interior structural framing shall be Douglas Fir (D.F.) with grades as noted below, unless otherwise specified on the drawings. All grades are per WCLIB standard grading rules.
1. All permanently exposed (interior or protected from weather) framing shall be select structural grade with no box heart.
  2. Except per 1 above, unless noted otherwise, minimum grades are:
    - a. Floor/roof joists/rafters (2x) and 2x8 & larger studs: D.F. No. 2
    - b. 2x4 and 2x6 studs and plates: D.F. No. 2
    - c. 4x and larger: D.F. No. 1
    - d. Blocking: D.F. No. 2
    - e. 6x8 and larger posts and beams may be SGL/CGL per below unless noted otherwise on the drawings.
- E. Exterior structural framing (exposed to weather) shall be redwood select structural grade or pressure treated D.F. No. 1, unless noted otherwise.
- F. Structural decking shall be D.F. select decking or White Pine select where not exposed to moisture. Where directly exposed to moisture or high humidity for prolonged periods of time, decking shall be Alaskan Yellow Cedar or Port Orford Cedar. Moisture content at time of installation to be less than 12%.
- G. Framing not otherwise shown or specified: Douglas Fir construction grade per WCLIB paragraphs applicable to uses and sizes required.

### 2.2 MANUFACTURED LUMBER

- A. Laminated Veneer Lumber (LVL): for use as joists, beams, blocking, or studs when so noted on the drawings. Conform to ICC AC 47. Minimum  $F_b = 2,600$  PSI. Minimum  $E = 2,000,000$  PSI.  
Acceptable products:
1. "Microllam LVL" by Trus Joist, ICC ESR-1387
  2. "Redlam LVL" by RedBuilt, ICC ESR-2993

# EXHIBIT C

## Rough Carpentry Section 06 1000

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3. Approved equal

B. Laminated Strand Lumber (LSL): for use as blocking (flat or vertical) or rim joist when used with I-joist or LVL, when so noted on the drawings. Conform to ICC AC 124. Minimum  $F_b = 1,700$  PSI. Minimum  $E = 1,300,000$  PSI. Acceptable products:

1. "Timberstrand LSL" by Trus Joist, ICC ESR-1387
2. "Redlam LSL" by Redbuilt, ICC ESR-1387
3. Approved equal

### 2.3 STRUCTURAL SHEATHING PANELS

A. Plywood: Structural sheathing shall conform to product standard PS-1 or PS-2. All panels shall have a minimum bond classification of "Exposure 1" and bear the trademark of the Engineered Wood Association (APA) or other qualified agency. Grades shall be "Rated Sheathing" or "Structural 1" as required on the drawings.

B. Oriented Strand Board (OSB): All structural OSB shall be grade marked by a qualified agency for conformance with Product Standard PS-2 and shall be fabricated with exterior glue. Grades shall be as required on the drawings.

### 2.4 TREATED WOOD:

A. Treated Lumber and Plywood: Comply with requirements of AWPA Standard U1. See Standard U1 for "Use Category" designations. Do not provide higher Use Category lumber than that specified. Maximum moisture content shall be the same as required for "dimensioned lumber" as specified above.

B. Preservative Treated Lumber

1. General

- a. Preservatives shall be waterborne. Preservative retention rate shall be as required per AWPA Standards U1 & T1. Lumber shall be Douglas Fir No. 2 (or better). Cut faces of treated wood shall be brush treated (two complete applications) prior to installation.
  - b. Lumber less than 8 inches above grade and lumber less than 6 inches above exterior hard-surface flatwork shall be treated.
  - c. Each piece of wood shall be stamped by the wood preservative applicator to identify its treatment and preservative retention.
2. Lumber at interior, non-weather exposed locations installed adjacent to concrete shall be Use Category UC2. Examples include sill plates & ledgers and lumber in contact with roofing, flashing, or water proofing. Borate treated lumber meeting AWPA UC2 is acceptable in this application.
3. Lumber at exterior locations, not in contact with soil/ground, shall be Use Category UC3B. Examples include Douglas Fir decking and deck framing.
4. Lumber in contact with soil/ground shall be Use Category UC4A. Examples include timber retaining walls.
5. Poles, posts, and sheathing panels shall be treated as recommended by AWPA Standard U1 per use and exposure.
6. Maximum Volatile Organic Compound (VOC) content of field-applied preservative shall meet local air quality standards and the California Green Building Code. Provide either of the following:
- a. Copper Azole (CA-B) per ICC-ES AC326.
  - b. Alkaline/Copper/Quaternary (ACQ).



# EXHIBIT C

- C. Fire Retardant Treatment: Product and application process must be recommended by manufacturer of treatment as being suitable for painting. Application shall be by a California State Fire Marshal approved licensed contractor.
1. Exterior Type: Use Category UCFB, chemically treated, and pressure impregnated; capable of providing a maximum flame spread rating of 25 when tested in accordance with ASTM E84, with no evidence of significant combustion when test is extended for an additional 20 minutes both before and after accelerated weathering test performed in accordance with ASTM D2898.
    - a. Treat exposed exterior rough carpentry items, including stairways, balconies, and covered walkways.
    - b. Do not use treated wood in direct contact with the ground.
  2. Interior Type: Use Category UCFA, low temperature (low hygroscopic) type, chemically treated, and pressure impregnated; capable of providing a maximum flame spread rating of 25 when tested in accordance with ASTM E84, with no evidence of significant combustion when test is extended for an additional 20 minutes.
    - a. Treat rough carpentry items as indicated.
    - b. Do not use treated wood in applications exposed to weather or where the wood may become wet.

## 2.5 FASTENERS AND ACCESSORIES

### A. General requirements for fasteners:

1. Fasteners shall be of adequate size, spacing, and number to resist design loads under intended use, and types shall be appropriate for the materials or conditions for which used.
2. Provide washers, pre-drilling, etc. as required for proper installation and to prevent damage to framing.
3. Fasteners shall be hot-dip galvanized (ASTM A153), mechanically galvanized (ASTM B695 class 55 minimum), stainless steel (type 303, 304, 305, or 316), silicon bronze, or copper by approved methods for the following applications:
  - a. Exterior, exposed use.
  - b. In contact with preservative or fire-retardant treated wood.
  - c. Nails in contact with preservative treated wood containing ammonia shall be stainless steel.
4. Fasteners in moist corrosive atmosphere to be of stainless steel (type 303, 304, 305, or 316).
5. Where the retention level of ACQ or MCQ preservative is greater than 0.40 pcf, CBA-A preservative is greater than 0.41 pcf, or CA-B preservative is greater than 0.21 pcf, provide stainless steel fasteners (type 303, 304, 305, or 316).
6. All fasteners specified by manufacturer shall be installed in framing hardware, unless noted otherwise.
7. At borate treated lumber a clear zinc coating per ASTM F1941 is acceptable.

### B. Nails and nailing not otherwise shown or specified:

1. Comply with requirements of governing building code.
2. For securing materials to hardened concrete provide Simpson Strong-Tie "Titen" screws.
3. For framing and general woodwork: Common bright wire nails (not box nails) with centered full-round heads per ASTM F1667 including Supplement S1. 16d cement coated sinker nails may be used in lieu of common nails for framing, where noted on the drawings. Unless otherwise noted on drawings, nail sizes shall be as follows

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- a. 8d Common: 0.131"ø x 2-1/2" long with 0.281"ø head.
  - b. 10d Common: 0.148"ø x 3" long with 0.312"ø head.
  - c. 16d Common: 0.162"ø x 3-1/2" long with 0.344"ø head.
4. Nails for sheathing panels shall be of common wire with full round heads and shall be of sufficient length to fully develop the nails.
  5. Machine-driven nails of all types must comply with the requirements of this section. All proposed nails shall match diameter and penetration of specified nails.
  6. Power Actuated Fasteners (PAF): Use only as approved by the Architect/Engineer; operators shall be qualified.
- C. Bolts: Malleable iron washers or steel plate washers, unless otherwise shown, shall be provided under all bolt heads and nuts.
1. Machine Bolts: ASTM A307 and ANSI/ASME B18.2.1, standard semi-finished machine bolts as shown or required. Nuts shall be standard size unless noted otherwise and shall be per ASTM A563.
  2. Anchor bolts or threaded rod anchors shall conform to ASTM F1554, ASTM A307, or ASTM A36. Anchor bolts shall be headed or end in two nuts tightened against one another, unless noted otherwise. Provide embedded plate washer as indicated on drawings. No upset threads allowed. No L or J bolts allowed.
- D. Lag screws: Standard hex lag screws per ANSI/ASME B18.2.1.
- E. Wood screws: Standard wood screws per ANSI/ASME B18.6.1.
- F. Power Actuated Fasteners (PAF): Hilti X-CP72, ICC ESR-2379; Simpson PDPAWL-300 MG, ICC ESR-2138.
- G. Framing hardware: Fabricated sheet metal timber framing connectors shall be manufactured from painted or galvanized G90 steel by Simpson Strong-Tie (connectors specified on drawings are per Simpson Strong Tie, or approved equivalent. Connectors shall be at least 16 gauge material, (1/8 inch plate materials where welded), unless otherwise noted, punched for nailing. All heavy hardware to be fabricated from A36 steel. All hardware intended for exterior exposed use shall be galvanized per G185 ASTM A653 or stainless steel.
1. For contact with preservative or fire-retardant treated wood, provide minimum G185 galvanizing per ASTM A653.
  2. Nails and nailing shall conform to the manufacturer's instructions with a nail provided for each punched hole. Nails to be used with framing accessories are subject to the requirements specified in this Section for fasteners and anchors.

### 2.6 SOURCE QUALITY CONTROL

- A. The Testing Agency, as specified in the Article QUALITY ASSURANCE, will perform testing for moisture content of all lumber at time of fastener installation.
- B. The Testing Agency will submit reports as specified in Division 01.

## PART 3 - EXECUTION

### 3.1 REQUIREMENTS FOR STRUCTURAL FRAMING

- A. General

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1. Refer to drawings for layouts, notes and details, provide framing as required; comply with governing building code requirements.
2. Provide framing to achieve true alignments as surfaces receiving finish materials.
3. It shall be the responsibility of the Contractor to provide and install all wood blocking, furring strips, or grounds detailed or required to provide anchorage for all finishes, accessories, fixtures, etc. as required to complete all work. All blocking and/or backing shall be securely bolted or otherwise anchored in place.
4. Contractor shall be responsible for layout of anchor bolts, and other hardware embedded in concrete when placed by other trades.
5. Provide and install all structural framing, blocking, fasteners, brackets, clips, etc. as required to complete work specified in the Construction Documents.

### B. Framing

1. Sill Plates and Ledgers:
  - a. Sill plates and ledgers on concrete shall be anchored with bolts, unless noted otherwise, shall have full bearing on concrete, and shall be placed for sheathing panel nailing as indicated. All bolt nuts shall be provided with a cut plate steel washer for bearing on wood.
  - b. Provide a minimum of two sill anchor bolts per sill piece with a bolt no less than 4 ½" and no more than 12" from the end of the sill. Bolts to be 5/8" diameter x 12" (18" at curb) long at 48" on centers, unless otherwise shown or noted. Provide additional anchor bolts each side of a notch or hole, as per a typical plate splice, where notch or hole is in excess of 1/3 the plate width. At shear walls, provide a plate washer 3" x 3" x 0.229" minimum between the sill and nut at anchor bolts. Plate washer to extend within ½ inch of the structural wall sheathing. Offset and/or stagger anchor bolts, or provide larger plate washer as required.
  - c. Anchor bolt holes in sill plates or ledgers shall be 1/16" maximum larger than anchor bolt.
2. Stud Walls and Framing:
  - a. Cut studs and posts with square ends, unless otherwise shown or noted. All posts and beams shall be "cut to bear" unless otherwise detailed.
  - b. All studs in walls shall be placed with the shortest dimension parallel to the run of the wall. Bearing studs shall extend full height to be the supporting framing as shown; non-bearing studs shall extend to the supporting framing.
  - c. Provide double studs on each side of all openings, unless shown or noted otherwise.
  - d. All openings in stud walls and partitions shall be framed with headers across the top, as shown, with a minimum size (6" nominal depth x stud width) resting on short cripple studs, and as shown on the drawings.
  - e. All stud partitions and walls shall have horizontal solid blocking not less than 2x and of the same width as the stud, fitted and nailed into the studs at mid-height of stud, for studs over 8 feet in height, except as otherwise shown or specified. This blocking shall be so spaced that there shall be no concealed air spaces greater than eight feet in any dimension.
  - f. Stud partitions containing plumbing, heating or other pipes shall be so framed as to give proper clearance for piping. Plumbing, heating and vent pipes exceeding 1-1/2" in inside diameter shall not be placed in partitions used as bearing or shear walls unless completely furred clear of the wall. No notching shall be allowed. Pipes shall be placed in the center of the plate using a neat bored hole and the plates shall be strapped on each side with 3" x 36" x 14 gauge steel punched for 10d nails 3" on center, staggered, or as shown on the drawings.
3. Top Plates

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- a. Top plates shall be double, set single. Corners where stud wall or partitions meet shall be framed with studs on all surfaces and blocking to form a "rigid" corner with nailing for all corners. Double top plates shall be lapped at corners. Lap splices and nailing per the drawings.
4. Floor, Roof and Ceiling Framing
  - a. Joists and beams shall be accurately aligned and the position and spacing of all joists and beams shall be as shown and be coordinated with other framing and to other trades prior to actual construction.
  - b. Place all joists and beams with crown up. Cantilevered joists and beams shall be placed with the crown down.
  - c. Cutting of wood girders, beams or joists for electrical and mechanical lines shall be limited to cuts and bored holes not deeper than 1/5 of the beam depth from the top and located not farther from the support than three times the beam depth and not less than the beam depth. Cuts in excess of this, or single bored holes with a diameter of more than 1" are not permitted without special provisions for framing the beams. Location of all cuts in framing shall receive the prior review of the Architect/Engineer.
  - d. Provide vent holes in rafters and/or blocking as shown and/or directed by the Architect.

### 3.2 STRUCTURAL SHEATHING

#### A. General

1. Sheathing nailing shall be as required on the drawings. Do not overdrive (Do not break skin of sheathing face sheet). Over driving will be cause for rejection.
2. Form sheathing may be re-used for concealed sheathing provided the lumber at the time of re-use is approved by the Architect, meets with the framing grade requirements specified herein, is in good condition, and is thoroughly cleaned with all nails removed.
3. Pneumatic nailing devices shall be adjustable so that nail heads do not penetrate skin of sheathing. Contractor shall submit equipment and nails for review prior to use. Refer to PART 2 for other nailing requirements.

B. Roof and Floor Sheathing: Except "Panelized Roofs", lay with face grain perpendicular to roof rafters, roof trusses or floor joists. Stagger sheets. Block all unsupported sheet edges with 2x material unless noted otherwise.

C. Wall Sheathing: Lay with face grain either parallel or perpendicular to studs. Exposed bottom edges shall be sealed as recommended by manufacturer. Block all unsupported sheet edges with 2x materials unless noted otherwise.

### 3.3 ROUGH HARDWARE

A. General: Nails, spikes, screws, fabricated sheet metal anchors, ties, hangers and any other materials shown or required for the attachment of wood to concrete and wood to steel and wood to wood shall be furnished and installed as part of this work.

B. Framing Nailing: All framing nailing shall conform to minimum requirements of the Building Code, and with details shown on the drawing.

C. Bolts, Lag Screws and Washers:

1. Bolts in wood shall be machine bolts unless otherwise noted and shall be of such length that the bearing length of the threads does not exceed  $\frac{1}{4}$  of the full bearing length in the

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member holding the threads. Bolt holes in wood shall be 1/32" oversized. Bolt holes for sill plates may be 1/16" maximum oversize. Holes in steel shall be 1/16" oversize. See Section 3.1 for anchor bolts at sill plates and ledgers.

2. Provide square plate or malleable iron washer and nut at head where bearing is against wood; cut washer under nut where it is against steel. Washer will not be required under head of carriage bolts. Provide malleable iron washers where exposed.
3. All nuts shall be tightened when placed and retightened at completion of the job or immediately before closing with final construction.
4. Lag screws shall be screwed (not driven) into place. Drill pilot hole to 70% of shank diameter. Drill clearance hole to full shank diameter and depth of unthreaded screw length.

D. Wood Screws: Minimum penetration is 10 diameters unless noted otherwise. Where fastening hardwood timber species or where wood tends to split, provide pilot hole 70% of screw shank diameter.

E. Proprietary Fasteners and Hardware: Install per manufacturer's published installation instructions (MPII) and code approval report (e.g. ICC ESR, IAPMO ER, etc). Provide MAX quantity, size, and length of fastener at hardware (i.e. joist hangers, framing, clips, etc) unless otherwise noted per plan.

### 3.4 INSTALLATION OF ACCESSORIES AND MISCELLANEOUS WOOD

A. Curb roof openings except where prefabricated curbs are provided. Form corners by alternating lapping side members. Fasten curbs corner-to-corner and to rafters with framing connectors configured for this application.

B. Blocking:

1. Provide fire blocking at locations and spacing's as required by CBC Chapter 7. Locate other blocking, supplementary framing, backing plates and bracing to facilitate installation of finish materials, fixtures, equipment, services, accessories, and trim requiring attachment and support.
2. Solid block joists and rafters over all supports with blocking of the same size and material as the joist or rafter.

C. Furring:

1. Nominal 1 inch x 3 inch minimum, continuous and spaced at 16 inches on center, maximum.
2. Install plumb, rigid, and level. Shim where necessary to provide a true, even plane suitable to receive the finish required.
3. Attach to concrete as shown in the contract drawings.

D. Bridging: Use 2 inch solid cross bridging. Nail bottom ends of bridging only after sheathing has been nailed.

E. Install miscellaneous metal angles, bolts, and other items; secure into formwork where embedded in concrete.

F. Install accessory items not otherwise set under other sections; after completion of painting and other finishing work; in locations shown or directed by the Architect. Set items plumb, level, and secure using appropriate fastening as applicable.

### 3.5 FIELD APPLIED WOOD TREATMENT

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- A. Field treat all end cuts and holes in preservative treated materials per PART 2.
- B. Apply two brush coats; or full-immersion dip not less than 15 minutes; or as required to thoroughly saturate all surfaces after cutting.
- C. Air dry 2-hours minimum before installation.

### 3.6 TOLERANCES

- A. Framing Members: 1/4 inch from true position, maximum.
- B. Surface Flatness of Floor: 1/8 inch in 10 feet maximum, and 1/4 inch in 30 feet maximum.
- C. Variation from Plane (Other than Floors): 1/8 inch in 10 feet maximum, and 1/4 inch in 30 feet maximum. Provide framed substrates meeting requirements for application of finishes specified in other sections.
- D. Exposed surfaces shall be free from dents and tool marks, unsanded rough or torn faces and corners, and other defects.

### 3.7 FIELD QUALITY CONTROL

- A. The Testing Agency, as specified in the Article QUALITY ASSURANCE, will perform the following tests and submit reports as specified in Division 01:
  - 1. Moisture content of all lumber at time of close-in.
  - 2. Periodic special inspection of nailing, bolting, and other fastening within the seismic-force-resisting system including shear walls, wood diaphragms, etc. per CBC Section 1705.13.2, excluding systems with sheathing nailing spacing greater than 4" on center.
  - 3. Special inspection of high load diaphragms per CBC Section 1705.5.1 where designated on documents.

### 3.8 ADJUSTING

- A. Replace all defective work at Contractor's expense.
- B. Replace defective or damaged work with conforming work.
- C. Correct defects using means that will not injure the materials.
- D. Replace defective or damaged work which cannot be corrected in the field with new work, or return defective items to the shop for repair.
- E. Repair or replace framing lumber sagged, twisted or warped due to shrinkage from excessive moisture content at time of installation, or from other causes.
- F. Adjust to meet specified tolerances.
- G. Architect/Engineer shall review all proposals for the repair or replacement of damaged, defective, or missing work.

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- H. Pay expenses incurred by Owner for Architect/Engineer's costs for (re-)design and obtaining approvals of Authorities Having Jurisdiction (AHJ) necessitated by incomplete, inefficiently scheduled, improperly performed, defective or nonconforming work.
- I. Pay expenses due to re-testing and re-inspection necessitated by incomplete, inefficiently scheduled, improperly performed, defective or nonconforming work.

### 3.9 CLEANING AND PROTECTION

- A. Clean all surfaces upon completion of erection, leave free of grime and dirt. Remove unused materials, tools, equipment, and debris from the premises and leave surfaces broomed clean.
- B. Waste Disposal: Comply with the requirements of pertinent sections of Division 01 specifying cleaning and disposal.
  - 1. Comply with applicable regulations.
  - 2. Do not burn scrap on project site.
  - 3. Do not burn scraps that have been pressure treated.
  - 4. Do not send materials treated with pentachlorophenol, CCA, or ACA to co-generation facilities or "waste-to-energy" facilities.
- C. Do not leave any wood, shavings, sawdust, etc. on the ground or buried in fill.
- D. Prevent sawdust and wood shavings from entering the storm drainage system.
- E. Protect work from damage by subsequent operations.

END OF SECTION

# EXHIBIT C

Interior Architectural Woodwork Section 06 4023

## INTERIOR ARCHITECTURAL WOODWORK SECTION 06 4023

### PART 1-GENERAL

#### 1.1 SUMMARY

A. Description: Provide Wood Casework, as shown and specified per Contract documents.

#### 1.2 SUBMITTALS

A. General: Refer to GENERAL CONDITIONS.

B. Shop Drawings: Submit shop drawings indicating materials, wood species, component profiles, dimensions, fastenings, joining details, finishes, hardware and accessories with WIC Certified Compliance Label on drawings for review.

C. Samples:

1. Plastic Laminate: Sample three (3) samples for color specified; alternate color if requested from manufacturer's standard plastic laminated colors; other products if specifically requested.

2. Plyboo/Bamboo Finishes: Submit three (3) samples, finished as specified.

3. Solid Wood Trims: Submit three (3) samples of each identified wood species, with sample edge easing, finished as specified.

D. Product Data: Submit manufacturer's literature for manufactured items.

E. Certificates:

1. General: WIC Certified Compliance Certificate for fabrication and installation of casework in grade specified.

2. Hardwood:

a. General: Submit certification and documentation verifying that hardwood lumber and veneers were obtained from sustainably managed sources and that certified lumber was properly segregated from other materials while in storage and production.

b. Acceptable Certifying Agencies:

1. Rainforest Alliance: "Smart Wood Program".

2. Scientific Certification System: "Forest Conservation Program".

F. Closeout:

1. General: Refer to GENERAL CONDITIONS.

2. Guarantee: Provide in required form for a period of one (1) year from date of final acceptance by Owner.



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## 1.3 QUALITY ASSURANCE

- A. General: Refer to GENERAL CONDITIONS.
- B. Reference Standards:
  - 1. General: Refer to GENERAL CONDITIONS for reference standards, applicable codes and definitions.
  - 2. National Electrical Manufacturers Association (NEMA): Standards.
  - 3. Hardwood Plywood and Veneer Association (HPVA): HPVA-01 – Hardwood and Decorative Plywood.
  - 4. Woodwork Institute of California (WIC): Manual of Millwork.
- C. Qualifications: Fabricator and installer having minimum of five (5) years experience with fabricating architectural woodwork similar to that required for the Project; member of Woodwork Institute, requirements of grade specified.

## PART 2- PRODUCTS

### 2.1 MATERIALS

- A. Transparent Finished Casework:
  - 1. Quality: WI MoM/Premium Grade, Type II, Style A, flush overlay type.
  - 2. Veneer: Match Plyboo/Bamboo veneers of existing Break Room casework
    - a. Veneer Thickness: Minimum 0.36" thick
  - 3. Particleboard Core: Provide Medite Corp. (Sierrapine) Medite II or Rodman Industries/Resincore I formaldehyde-free medium density fiberboard (MDF) or particleboard made from recycled wood products.
  - 4. Exposed Edges: Hardwood matching veneer
- B. Plastic Laminate Countertops:
  - 1. General: Class I high-pressure decorative laminate plastic manufactured by Formica Group; UBC Class II flame spread.
  - 2. Alternate Manufacturers: Comparable products manufactured by Wilsonart, or accepted equal.
  - 3. Plastic Veneer: NEMA Standard .039 inch postforming grade and .045 inch general purpose grade; satin finish.
  - 4. Backing Sheets: .020 inch thick standard laminate.
  - 5. Color: Fog 961-58 Matte Finish
- C. Solid Surface Countertops: See specification section 06 6500 Solid Surfacing

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## Interior Architectural Woodwork Section 06 4023

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### D. Casework Hardware:

1. General: Per WIC Standards, and as follows.
2. Finish: Exposed hardware; dull chromium (US26D).
3. Hinges: Blum Clip 125+ hinge – 125 degree opening with zinc die cast base plate, or accepted equal fully concealed hinges.
4. Door and Drawer Pulls: Hafele Cat. No. 117.31.632, 5-inch (128mm) center or equal by Builders Brass Works No., Quality, Stanley or approved equal, polished chrome finish
5. Silencers: Manufactured by Ceco Building System Division of Robertson-Ceco., or accepted equal.
6. Drawer Guides:
  - a. General: Manufactured by Accuride International, Inc., or accepted equal.
  - b. Small Drawer: Model No. 2037; 50 lbs.
  - c. Medium Drawer: Model No. 2025A; 75 lbs.
  - d. Large Drawer: Model No. 7432; 100 lbs.
7. Adjustable Shelf Hardware: Lamp No. SS-323 manufactured by Sugatsune America, Inc., or accepted equal.
  - a. Alternate Manufacturers: No known equal.
8. Hole Plugs: Model No. MP-0500 manufactured by Outwater Plastic Industries, Inc., or accepted equal.

### E. Fasteners and Adhesives: Per WIC requirements.

### F. Solid Wood Trims at Acoustic Panels: Clear Douglas Fir

### G. Finishes:

1. Transparent Finished Woodwork: Finish architectural woodwork in shop unless otherwise indicated
  - a. Plyboo/Bamboo: Provide samples to match existing Break Room cabinet finish
  - b. Sand work smooth; seal, stain and varnish concealed and semi-concealed surfaces of transparent finished woodwork; brush apply
  - c. Transparent Finish: WI MoM/Premium Grade clear finish producing a dull rubbed effect, as approved by Architect
2. Solid Wood Trims at Acoustic Panels: See Section 09 9100 Painting. Paint prior to installation. Fill and touch up paint for smooth, imperceptible finish at field attachments.

## 2.2 MISCELLANEOUS MATERIALS

- A. VOC Limits for Installation Adhesives and Glues: Use installation adhesives that comply with the following limits for VOC content when calculated according to 40 CFR 59, Subpart D (EPA Method 24):
  1. Wood Glues: 30 g/L.
  2. Multipurpose Construction Adhesives: 70 g/L.

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3. Contact Adhesive: 250 g/L.

## 2.3 FABRICATION

- A. General: Manufacture to Custom Grade standards, except where specifically noted otherwise, per Section 14 of the Manual of Millwork. Provide WIC Certified Compliance Label for grade specified, to each elevation of casework.
- B. Construction:
  1. General: Style A; Type II. Completely face exposed and semi-exposed surfaces, with specified hardwood species. As far as practical, fabricate casework complete as a unit in the shop; backs required.
  2. Door and Drawer Fronts: Flush; Type I.
  3. Shelves: Edge banded plywood faced to match cabinet exterior.
  4. Open cubicle "cubbies": Completely faced at all faces and edges with specified hardwood species.
  5. Inside Surfaces of Doors and Drawers: Either bamboo or White Birch stained to match general color of exterior veneers; melamine interior is not acceptable. Conflicts w/ other items in orig spec
  6. Inside Cabinets except as noted elsewhere: White melamine
  7. Filler Panels: As required; to match cabinets as shown.
  8. Finish: Factory finish exposed, interior and semi-exposed surfaces, including drawer interiors, backs, sides and bottoms, and related wood trim, to WIC Custom Grade standards.
- C. Plastic Laminate Countertops: In accordance with specified quality standards
- D. Solid Surface Countertops: As specified in section 06 6500 Solid Surfacing
- E. Hardware:
  1. General: Pre-fit; remove for application of finish. Keep hardware with casework to which it has been pre-fit; reinstall after installation of unit at job site.
  2. Hinges: Four (4) No. 8 screws into end panel and door panel; 1-1/2 pair on 7'-0" high cabinet doors; tall cabinet door must swing 180 degrees when adjacent to low cabinets without interference from counter top.
  3. Magnetic Catches: One catch on cabinet doors up to 48 inches high; two catches (top and Bottom) on cabinet doors over 48 inches high.

## PART 3- EXECUTION

### 3.1 PERFORMANCE

- A. General: Refer to GENERAL CONDITIONS.

### 3.2 PREPARATION

- A. Environmental Requirements: Store materials indoors in an area with a relative humidity 50 percent or less; temperature 70 degrees F minimum.

# EXHIBIT C

## Interior Architectural Woodwork Section 06 4023

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- B. Examination: Examine conditions of work in place before beginning work; report defects.
- C. Measurements: Take field measurements prior to fabrication; report variance between plan and field dimensions.
- D. Delivery: Use clean, nonstaining materials for blocking and packing. Carefully load and cover for shipment; do not transport during inclement weather.

### 3.3 INSTALLATION

- A. General: Install in conformance with referenced standards, manufacturer's written directions, as shown, and as specified.
- B. Casework:
  - 1. General: Install level, with tight joints between units; scribe edges to fit adjacent structure. Secure to blocking or plates in wall or to casework carriers with lag bolts with washers to permit removal. Screws shall penetrate not less than 1 inch into 2 inch nominal blocking or framing
  - 2. Filler Panels: Scribe to cabinet and abutting structure.
- C. Countertops
  - 1. Apply plastic laminate finish in full uninterrupted sheets consistent with manufactured sizes.
  - 2. Make corners in joints hairline; slightly bevel arises.
  - 3. Locate butt joints at least 2'-0" from cutouts.
  - 4. Provide for cutouts for inserts, fixtures, and fittings; verify locations from on-site dimensions
  - 5. Install level, using concealed fasteners, with tight joints; scribe to fit wall surfaces.
- D. Hardware:
  - 1. General: Check hardware upon delivery to site; store in an orderly manner. Fit and install in place without marring or injuring either hardware or casework.
  - 2. Seismic Restraint: As shown.
- E. Solid Wood Trims:
  - 1. Ease edges 1/8"
  - 2. Sand all surfaces
  - 3. Pre-prime and paint prior to installation
  - 4. Miter corner joints and fit flush
  - 5. Fit tightly and neatly to existing surfaces
  - 6. Countersink and fill all nail or screw attachments; sand flush; paint to match solid wood trims.
- E. Finish: Touch-up repair to factory-applied condition.

# EXHIBIT C

## Interior Architectural Woodwork Section 06 4023

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### 3.4 CLEANING

- A. General: Immediately following installation, clean casework to remove all dirt, stains, scratches, and abrasions. Protect casework against damage by other trades; repair or replace damaged and deface material at no cost to Owner.

### 3.5 JOBBING

- A. General Six (6) months after final acceptance of the building, and at any time within a year after acceptance when so directed, examine all casework doors, drawers, fittings, etc., and perform such fitting and adjustments as necessary to put all items in good condition and working order.

**END OF SECTION 06 4023**

# EXHIBIT C

Solid Surfacing Section 06 6500

## SOLID SURFACING SECTION 06 6500

### PART 1-GENERAL

#### 1.1 SUMMARY

- A. Drawings and general provisions of the Contract, including General and Supplementary Conditions apply to this Section.

#### 1.2 SUBMITTALS

- A. Shop drawings: Indicate dimensions, component sizes, fabrication details and attachment provisions
- B. Samples: Submit minimum 2" x 2" samples. Indicate full range of color and pattern variation.
- C. Product data: Indicate product description, fabrication information and compliance with specified performance requirements.

#### 1.3 DELIVERY, STORAGE AND HANDLING

- A. Handle materials to prevent damage to finished surfaces. Provide protective coverings to prevent damage or staining following installation until accepted by owner.

#### 1.4 WARRANTY

- A. Provide manufacturer's 10 year warranty against defects in materials.

### PART 2-PRODUCTS

#### 2.1 SOLID SURFACE COUNTERTOP MATERIAL

- A. Manufacturer: Wilsonart Quartz, Lorraine Q1012, or approved equal
- B. Grade: Premium.
- C. Solid-Surfacing-Material Thickness: 0.79" (2cm)
- D. Fabricate tops in one piece, unless otherwise indicated. Comply with manufacturer's written recommendations for adhesives, sealers, fabrication, and finishing.
  - 1. Fabricate tops with shop-applied edges of materials and configuration indicated.
- E. Drill holes in countertops for plumbing fittings .

#### 2.2 ACCESSORY PRODUCTS

- A. Joint adhesive: Manufacturer's standard adhesive to create inconspicuous, non-porous joints, with a chemical bond.

# EXHIBIT C

## Solid Surfacing Section 06 6500

### 2.3 FABRICATION

- A. Fabricate components in shop to sizes and shapes indicated, in accordance with approved shop drawings and solid surface manufacturer requirements.
- B. Form joints between components using manufacturer's standard joint adhesive. Joints shall be inconspicuous in appearance.
- C. Provide holes and cutouts for plumbing and accessories
- D. Rout and finish component edges to a smooth, uniform finish. Rout all cutouts, and sand all edges smooth. Repair or reject defective or inaccurate work.

### PART 3-EXECUTION

#### 3.1 INSTALLATION

- A. Countertops and Backsplashes: Anchor securely by screwing through blocks of base or steel supports into underside of countertop.
- B. Align solid-surfacing-material countertops and backsplashes, and form seams to comply with manufacturer's written recommendations using adhesive in color to match countertop. Dress joints smoothly, remove surface scratches, and clean entire surface.
- C. Rout and finish component edges to a smooth, uniform finish. Rout all cutouts, and then sand all edges smooth. Repair or reject defective or inaccurate work.
- D. Form joints between components using manufacturer's standard joint adhesive. Joints shall be inconspicuous in appearance and without voids. Attach 2" (50 mm) wide reinforcing strip of solid polymer material under each joint.
- E. Install countertops with no more than 1/8 inch in 96-inch sag, bow, or other variation from a straight line.
- F. Caulk space between backsplash and wall with sealant specified in Division 07 Section "Joint Sealants."
- G. Form field joints using manufacturer's recommended adhesive, with joints inconspicuous in finished work.
- H. Remove adhesives, sealants and other stains.

#### 3.2 REPAIR & PROTECTION

- A. Protect surfaces from damage until Date of Substantial Completion. Repair or replace damaged work.

**END OF SECTION 06 6500**

# EXHIBIT C

Elastomeric Sheet Waterproofing Section 07 1353

## ELASTOMERIC SHEET WATERPROOFING SECTION 07 1353

### PART 1 - GENERAL

#### 1.1 GENERAL

- A. The requirements of the General Conditions, Special Conditions, and Division 1 apply to the work of this Section.

#### 1.2 DESCRIPTION

- A. This Section describes the requirements for furnishing and installing elastomeric sheet waterproofing at the following locations:
  - 1. Under mortar-set wall and floor tile in shower

#### 1.3 SUBMITTALS

- A. Product Data: Manufacturer's specifications, installation instructions, and general recommendations for each waterproofing material. Include data substantiating compliance with specified requirements.
- B. Warranty.

#### 1.4 QUALITY ASSURANCE

- A. Installer Qualifications: Minimum 3-years' experience in the installation of waterproofing of the type specified, and approved by the manufacturer of the waterproofing materials.

#### 1.5 JOB CONDITIONS

- A. Substrate: Proceed with waterproofing work only after substrate construction and penetrating work have been completed.
- B. Coordinate finishing and curing of concrete surfaces to receive waterproofing with work of Section 03 3000.
- C. Ventilation: Provide adequate ventilation to prevent accumulations of hazardous fumes during application of solvent-based components in enclosed spaces, and maintain ventilation until coatings have cured.

#### 1.6 WARRANTY

- A. Warrant elastomeric sheet waterproofing to be free from defects in materials and workmanship for a period of 3-years from date of Substantial Completion. Warranty shall include removal and replacement of materials installed over elastomeric sheet waterproofing, including but not limited to mortar setting bed and tile. This warranty shall be in addition to and not a limitation of other rights the Owner may have against the Contractor under the Contract Documents.

### PART 2 - PRODUCTS

#### 2.1 ELASTOMERIC SHEET WATERPROOFING MATERIALS

- A. Sheet Membrane: The Noble Company "Choraloy 240" heavy-duty non-plasticized CPE synthetic elastomeric, 1mm (0.048-inch) nominal thickness or approved equal.
- B. Seam Cement: As recommended by sheet membrane manufacturer.



# EXHIBIT C

## Elastomeric Sheet Waterproofing Section 07 1353

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- C. Adhesive and Sealant: The Noble Company "Noblesealant 150" or as recommended by sheet membrane manufacturer for seaming, caulking drains and adhering sheet.
- D. Preformed outside Corners: The Noble Company "Outside Dam Corners" or as recommended by sheet membrane manufacturer for forming outside corners.

### PART 3 - EXECUTION

#### 3.1 PREPARATION

- A. Clean substrate of projections and substances detrimental to work; comply with recommendations of prime materials manufacturer.
- B. Concrete surfaces shall be smooth, clean, and be free from dirt and grease.

#### 3.2 INSTALLATION

- A. Comply with manufacturer's installation instructions using the fully-adhered method of installation.
- B. Precut membrane allowing for overlap at seams and upturn at walls.
- C. Form seams by either lapping membrane 3-inches at ends and sides, or by butting membrane sheets together and covering with a 6-inch wide cap. Lap joints in the direction of watershed. Clean lap and splice areas as recommended by membrane manufacturer prior to applying welding agent.
- D. Extend membrane up walls a minimum of 6-inches above finished tile surface at wall.
- E. Secure membrane to walls with sheet metal screws and washers 1/2-inch from top edge or use adhesive over solid backing. Where metal studs are used and no back-up is provided, secure to studs with sheet metal screws and washers. Fold material over 1-inch at the top and fasten to backing and studs.
- F. Extended membrane into floor drain clamping rings. Apply heavy bead of sealant under sheet at clamping ring.

#### 3.3 WATER TESTING

- A. Upon completion of work, test for leaks by plugging the drain or damming areas and filling with 3-inches of water. Allow water to stand for 24-hours and inspect for leakage. Make necessary adjustments to stop leakage and retest until watertight.

#### 3.4 PROTECTION

- A. Do not permit traffic on completed membrane prior to application of surfacing material.

**END OF SECTION 07 1353**

# EXHIBIT C

Thermal & Acoustical Insulation

## THERMAL & ACOUSTICAL INSULATION

SECTION 07 2100

### PART 1 - GENERAL

#### 1.1 GENERAL

- A. The requirements of the General Conditions Division 1 apply to the work of this Section.

#### 1.2 DESCRIPTION

- A. This Section describes the requirements for furnishing and installing thermal and acoustical insulation.

#### 1.3 SUBMITTALS

- A. General: Comply with General Conditions Division 1
- B. Product Data: Manufacturer's specifications for each type of insulation required.

#### 1.4 QUALITY ASSURANCE

- A. Thermal Conductivity: Where insulation is indicated or specified by "R" value, provide thickness required to achieve indicated value. Use aged and settled values for thermal resistance factors (R-values), tested in accordance with ASTM C518 at 75-deg. F. and 50-percent relative humidity for at least 6-months.
- B. Fire Ratings: Comply with fire-resistance and flammability ratings specified.

#### 1.5 PRODUCT DELIVERY, STORAGE, AND HANDLING

- A. General: Comply with General Conditions Division 1
- B. Protect insulation from physical damage and from becoming wet or soiled. Comply with manufacturer's recommendations for handling, storage and protection during installation.

#### 1.6 TESTING AND INSPECTIONS

- A. Inspect insulation for proper installation. Correct defects such as voids, gaps or insulation compressed behind pipes before accepting work.

#### 1.7 INDOOR AIR QUALITY

- A. Protect ducts and HVAC system from loose insulation particulates.
- B. Provide temporary ventilation of building areas where building insulation is being installed.

### PART 2 - PRODUCTS

#### 2.1 THERMAL BATT AND BLANKET INSULATION

- A. Unfaced Formaldehyde-Free Thermal Batt/Blanket Insulation:
  - 1. Basis of Design: Johns Manville "Formaldehyde-free Unfaced" or a comparable product by one of the following manufacturers:
    - a. Owens Corning
    - b. CertainTeed Corporation.
    - c. Guardian Building Products, Inc.
    - d. Johns Manville.

# EXHIBIT C

## Thermal & Acoustical Insulation

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2. Material: Thermal fiberglass insulation made from resilient glass fibers bonded with a formaldehyde-free acrylic thermosetting binder, complying with ASTM C665, Type I.
3. Surface Burning Characteristics: Flame spread 25 or less; smoke developed 50 or less, when tested in accordance with ASTM E84.
4. Thickness: As required to fill walls.

### 2.2 ACOUSTIC BATT INSULATION

- A. Basis of Design: Provide Select Sound Black Acoustic Blanket, by Owens Corning, Toledo, Ohio 43659, Tel: 1-800-GET-PINK, [www.owenscorning.com](http://www.owenscorning.com). Subject to compliance with requirements, provide the named product or a comparable product by one of the following manufactures:
  1. Owens Corning
  2. CertainTeed Corporation.
  3. Guardian Building Products, Inc.
  4. Johns Manville.
  5. Knauf Insulation.
- B. Sound Attenuation Batts, Unfaced Glass-Fiber Blanket Insulation: ASTM C 665, Type I; with maximum flame-spread and smoke-developed indexes of 25 and 50, respectively, per ASTM E 84; passing ASTM E 136 for combustion characteristics.
- C. Sustainability Requirements: Provide glass-fiber blanket insulation as follows:
  1. Free of Formaldehyde: Insulation manufactured with 100 percent acrylic binders and no formaldehyde.
  2. Low Emitting: Insulation tested according to ASTM D 5116 and shown to emit less than 0.05-ppm formaldehyde.
  3. Thickness as required to fill walls.

## PART 3 - EXECUTION

### 3.1 INSTALLATION

- A. Comply with manufacturer's instructions for installation conditions.
- B. Do not install insulation until building is sufficiently enclosed or protected against absorption of moisture by the insulation, and do not install insulation unless supporting framing and construction is in a thoroughly dry condition.
- C. Install snugly between framing members with ends snugly fitted between units and against adjacent construction.
- D. Carefully cut and fit insulation around pipes, conduit, and other obstructions and penetrations.
- E. Where door, window and skylight frames occur in framing, cut additional strips of insulation and hand-pack as required to fill voids in and around such frames.
- F. Use insulation free of ripped backs and edges.

### 3.2 PROTECTION

- A. Protect installed insulation from harmful exposures and from physical damage.

END OF SECTION 07 2100

# EXHIBIT C

Metal Wall Panels Section 07 4213

## METAL WALL PANELS SECTION 07 4213

### PART 1 - GENERAL

#### 1.1 SUMMARY

- A. This Section includes the following:
  - 1. Preformed metal wall panels and accessories

#### 1.2 DEFINITIONS

- A. Metal Wall Panel Assembly: Metal wall panels, attachment system components, miscellaneous metal framing, rubberized asphalt membrane, thermal insulation, and accessories necessary for a complete weather tight system.

#### 1.3 SUBMITTALS

- A. General: Refer to GENERAL CONDITIONS
- B. Product data including manufacturer's product specifications, standard details, certified product test results, installation instructions, and general recommendations, as applicable to materials and finishes for each component and for the panel system.
- C. Samples of panel profile, finish and color for verification purposes. Provide sample panels 12 inches long by actual panel width, in the profile, style, color, and texture indicated. Include J-mold, fasteners, closures, and other panel accessories.

### PART 2 - PRODUCTS

#### 2.1 MANUFACTURERS

- A. In other Part 2 articles where titles below introduce lists, the following requirements apply to product selection:
  - 1. Manufacturers: Design is based on the performance and appearance characteristics of:
    - a. Corrugated Metal Siding: Profile to match existing siding; confirm matching profile with an AEP-Span product or equal, 24 gauge minimum, or a comparable product by one of the following manufactures:
      - 1. ATAS International, Inc.
      - 2. Metallic Building Co.
      - 3. McElroy Metals, Inc.

# EXHIBIT C

## Metal Wall Panels Section 07 4213

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### 2.2 FINISHES

- A. General: Factory-coated finish to match existing, or match existing color, paint replacement panel prior to installation.

### 2.3 MISCELLANEOUS MATERIALS

- A. Fasteners: Re-use salvaged non-damaged fasteners, or new self-tapping fasteners to match existing exposed fasteners, paint to match existing.
  - 1. Use corrosion-resistant steel, or stainless steel fasteners for exterior application .
  - 2. Provide metal-backed neoprene washers under heads of exposed fasteners bearing on weather side of panels.

### 2.4 ACCESSORIES

- A. Wall Panel Accessories: Match material and finish of existing metal wall panels
  - 1. Closures, flashings and trim: Provide pre-painted J-flashing at wall penetrations of same metal as metal wall panels.
  - 2. Closure Strips: Closed-cell, expanded, cellular, rubber or crosslinked, polyolefin-foam or closed-cell laminated polyethylene; minimum 1-inch- (25-mm-) thick, flexible closure strips; cut or pre-molded to match metal wall panel profile. Provide closure strips where indicated or necessary to ensure weathertight construction.
  - 3. Backing Plates: Provide metal backing plates at panel end splices, fabricated from material recommended by manufacturer.
- B. Clips:
  - 1. Provide UL listed clip designed to allow panels to thermally expand and contract and provide  $\pm 1$  inch of thermal movement. Clip shall incorporate a self-centering feature to allow 1" of movement in both directions along panel length.
  - 2. Clip shall be designed to meet positive and negative pressures as calculated per local building code.

### 2.5 FABRICATION

- A. General: Fabricate and finish panels and accessories at the factory to greatest extent possible, by manufacturer's standard procedures and processes, as required to fulfill indicated performance requirements demonstrated by laboratory testing. Comply with indicated profiles and dimensional requirements and with structural requirements.
- B. Apply bituminous coating or other permanent separation materials on concealed panel surfaces where panels would otherwise be in direct contact with substrate materials that are incompatible or could result in corrosion or deterioration of either material or finishes.
- C. Provide on single seamless piece, with corrugations aligning with and overlapping the existing corrugated siding.

# EXHIBIT C

## Metal Wall Panels Section 07 4213

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### 2.6 MISCELLANEOUS MATERIALS

- A. Panel Fasteners: Self-tapping screws, bolts, nuts, self-locking rivets and bolts, end-welded studs, and other suitable fasteners designed to withstand design loads. Provide exposed fasteners with heads matching color of metal wall panels by means of plastic caps or factory-applied coating. Provide EPDM, PVC, or neoprene sealing washers.
- B. Bituminous Coating: Cold-applied asphalt mastic, SSPC-Paint 12, compounded for 15-mil (0.4-mm) dry film thickness per coat. Provide inert-type noncorrosive compound free of asbestos fibers, sulfur components, and other deleterious impurities.

### 2.7 MISCELLANEOUS METAL FRAMING (IF NEEDED)

- A. General: Comply with ASTM C 754 for conditions indicated.
  - 1. Steel Sheet Components: Complying with ASTM C 645 requirements for metal and with manufacturer's standard corrosion-resistant zinc coating.
- B. Hat-Shaped, Rigid Furring Channels: ASTM C 645.
- C. Z-Shaped Furring: With slotted or nonslotted web, face flange of 1-1/4 inches (32 mm), wall attachment flange of 7/8 inch (22 mm), minimum bare metal thickness of 0.0179 inch (0.45 mm), and depth required to fit insulation thickness indicated.
- D. Fasteners for Metal Framing: Of type, material, size, corrosion resistance, holding power, and other properties required to fasten steel members to substrates.

## PART 3 - EXECUTION

### 3.1 EXAMINATION

- A. Examine substrates, areas, and conditions for compliance with requirements for installation tolerances, metal wall panel supports, and other conditions affecting performance of the Work.
- B. Examine primary and secondary framing to verify that support members and anchorages have been installed within alignment tolerances required by metal wall panel manufacturer.
- C. Examine sheathing to verify that sheathing joints are supported by framing or blocking and that installation is within flatness tolerances required by metal wall manufacturer.
- D. Examine roughing-in for components and systems penetrating metal wall panels to verify actual locations of penetrations relative to seam locations of metal wall panels before metal wall panel installation.
- E. Proceed with installation only after unsatisfactory conditions have been corrected.

### 3.2 PREPARATION

- A. Clean substrates of substances harmful to installation, including removing projections capable of interfering with attachment.

# EXHIBIT C

## Metal Wall Panels Section 07 4213

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- B. Miscellaneous Framing: Install miscellaneous panel support members and anchorage according to metal wall panel manufacturer's written instructions.

### 3.3 WALL PANEL INSTALLATION

- A. General: Comply with manufacturers' instructions and recommendations for installation, as applicable to project conditions and supporting substrates. Anchor panels and other components of the work securely in place, with provisions for thermal and structural movement.
  - 1. Field cutting of exterior panels by torch is not permitted.
  - 2. Install panels with exposed fasteners to match existing.
  - 3. Install panels at least 3-inch side laps and 4-inch end laps over existing panels.
- B. Accessories: Install components required for a complete panel system, including trim, clips, seam covers, flashings, sealants, gaskets, fillers, closure strips, and similar items.
- C. Joint Sealers: Install gaskets, joint fillers, and sealants where indicated and where required for weatherproof performance of panel systems. Provide types of gaskets, sealants, and fillers indicated or, if not otherwise indicated, types recommended by panel manufacturer.
- D. Metal Protection: Where dissimilar metals will contact each other or corrosive substrates, protect against galvanic action by painting contact surfaces with bituminous coating, by applying rubberized-asphalt underlayment to each contact surface, or by other permanent separation as recommended by metal wall panel manufacturer.
  - 1. Coat back side of wall panels with bituminous coating where panels will contact wood, ferrous metal, or cementitious construction.

### 3.4 ACCESSORY INSTALLATION

- A. General: Install accessories with positive anchorage to building and weathertight mounting and provide for thermal expansion. Coordinate installation with flashings and other components.
  - 1. Install components required for a complete metal panel assembly including trim, flashings, sealants, gaskets, fillers, closure strips, and similar items.
- B. Flashing and Trim: Comply with performance requirements, manufacturer's written installation instructions, and SMACNA's "Architectural Sheet Metal Manual." Set units true to line and level as indicated. Install work with laps, joints, and seams that will be permanently watertight and weather resistant.
  - 1. Install exposed flashing and trim that is without excessive oil canning, buckling, and tool marks and that is true to line and levels indicated. Install sheet metal flashing and trim to fit substrates and to result in waterproof and weather-resistant performance.
  - 2. Expansion Provisions: Provide for thermal expansion of exposed flashing and trim. Space movement joints at a maximum of 10 feet (3 m) with no joints allowed within 24 inches (600 mm) of corner or intersection. Where lapped expansion provisions cannot be used or would not be sufficiently weather resistant and

# EXHIBIT C

## Metal Wall Panels Section 07 4213

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waterproof, form expansion joints of intermeshing hooked flanges, not less than 1 inch (25 mm) deep, filled with mastic sealant (concealed within joints).

### 3.5 CLEANING AND PROTECTION

- A. Damaged Units: Replace panels and other components of the work that have been damaged or have deteriorated beyond successful repair by means of finish touch-up or similar minor repair procedures.

END OF SECTION 07 4213



# EXHIBIT C

Joint Sealants Section 07 9200

## JOINT SEALANTS SECTION 07 9200

### PART 1 - GENERAL

#### 1.1 GENERAL

- A. The requirements of the General Conditions, Special Conditions, and Division 1 apply to the work of this Section.

#### 1.2 DESCRIPTION

- A. This Section describes the requirements for furnishing and installing joint sealants.

#### 1.3 SUBMITTALS

- A. General: Comply with Section 01 33 00.
  - B. Product Data: Manufacturer's technical data for each product required, including instructions for joint preparation and sealant application. Include certification by joint sealant manufacturer that sealants, primers, and cleaners comply with local regulations controlling the use of volatile organic compounds (VOC). Include tested physical and performance properties. Include data sheets for substrate cleaners and substrate primers recommended by sealant manufacturer for specific substrate surface conditions.
  - C. Joint Sealant Schedule: Include the following information:
    - 1. Joint sealant application and typical joint locations to receive sealants.
    - 2. Joint sealant manufacturer and product name.
    - 3. Joint sealant formulation and color.
  - D. Samples: Manufacturer's bead samples of actual products showing full range of colors for each product exposed to view, including custom colors if required.
  - E. Test Reports:
    - 1. Certified test results of elastomeric sealants showing compliance with specified requirements. Include results of aged performances including hardness, stain-resistance, adhesion and cohesion under cyclic movement, low temperature flexibility, modulus of elasticity at 100-percent strain, affects of heat and aging, and affects of accelerated weathering.
    - 2. Preconstruction field test results indicating which products and joint preparation methods demonstrated acceptable adhesion to joint substrates.
  - F. Certificates: Manufacturer's certification that joint sealants comply with specified requirements and are suitable for uses indicated.
  - G. Installer qualifications.
  - H. Warranty.
- #### 1.4 QUALITY ASSURANCE
- A. Installer's Qualifications: Approved by the sealant manufacturer with a minimum of 5-years' experience on Projects of similar scope and scale.

# EXHIBIT C

## Joint Sealants Section 07 9200

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- B. Obtain joint sealant materials from a single manufacturer for each product required unless otherwise approved.
- C. Preconstruction Field Testing: Prior to installation of joint sealants, field-test adhesion to joint substrates.
  - 2. Install joint sealants in 5-foot joint lengths. Allow to cure before testing. Test adhesion by pulling sealant out of joint according to "Method A, Field-Applied Sealant Joint Hand Pull Tab", in Appendix X1 in ASTM C1193. For joints with dissimilar substrates, verify adhesion to each substrate separately; extend cut along one side, verifying adhesion to opposite side. Repeat procedure for opposite side.
  - 3. Perform field tests for each type of elastomeric sealant and joint substrate.
  - 4. Arrange for tests to take place with joint sealant manufacturer's technical representative present.
  - 5. Report whether or not sealant in joint connected to pulled-out portion failed to adhere to joint substrates or tore cohesively. Include data on pull distance used to test each type of product and joint substrate.
  - 6. Sealants not evidencing adhesive failure from testing, in absence of other indications of noncompliance with requirements, will be considered satisfactory. Do not use sealants that fail to adhere to joint substrate during testing.
- D. Pre-installation Meeting: Conduct at the Project site to review requirements for sealant work.

### 1.5 PRODUCT DELIVERY, STORAGE, AND HANDLING

- A. General: Comply with Section 01 60 00.
- B. Deliver materials in the unopened, original containers or unopened packages with manufacturer's name, labels, product identification, color, expiration period, curing time and mixing instructions for multi-component materials.
- C. Store materials in the original, unopened containers or packages, and under conditions recommended by manufacturers. Store materials in a clean, dry protected location on raised platforms with weather-protective coverings, within temperature range required by sealant manufacturer.
- D. Protect stored materials from direct sunlight.
- E. Sealant manufacturer's standard packaging and covering is not considered adequate protection.

### 1.6 PROJECT CONDITIONS

- A. Environmental Conditions: Do not install sealants when ambient and substrate temperature conditions are outside limits permitted by joint sealant manufacturer, or to wet joint substrates.
- B. Joint Width Conditions: Do not install sealants when joint widths are less than permitted by sealant manufacturer.
- C. Joint Substrate Conditions: Do not proceed with installation of joint sealants until contaminants capable of interfering with their adhesion are removed from joint substrates.

### 1.7 WARRANTY

- A. Exterior Sealants: Furnish a written warranty against leaks or other defects of materials and workmanship for a period of 10-years. Defects include but are not limited to changes in the structural, physical or chemical properties of the sealant materials that impair function or require abnormal maintenance, changes in surface finish, color or texture, failure in adhesion, weather resistance or durability, failure to prevent entry of water, or failure to comply with specified requirements.

# EXHIBIT C

## Joint Sealants Section 07 9200

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- B. This warranty shall not cover formation of cracks or defects in substrate materials adjacent to the seal, joint movement in excess of movement rating of sealant, or physical damage caused by others.
- C. Repair or replace defective materials and workmanship during warranty period without expense to Owner, including removal and replacement of other items as required.
- D. This warranty shall be in addition to and not a limitation of other rights the Owner may have against the Contractor under the Contract Documents.

### PART 2 - PRODUCTS

#### 2.1 MATERIALS, GENERAL

- A. Provide color of exposed joint sealants as selected by Architect. Custom colors may be used.
- B. Provide joint sealers, joint fillers and other materials that are compatible with one another and with joint substrates, as demonstrated by testing and field experience.

#### 2.2 ELASTOMERIC JOINT SEALANTS

- A. Exterior Building Sealant: Either one-part silicone complying with ASTM C920, Type S, Grade NS, Class 25, 50 or 100 depending on product used, Use NT, M, A, and O or multi-component polyurethane complying with ASTM C920, Type M, Grade NS, Class 25, Use NT, M, A, and O. Dow Corning Corp. "790" or "795", Tremco "Spectrem 1" or approved equal. Sealant shall resist ultra-violet, heat, ozone and moisture exposure and shall withstand substrate surface temperatures as high as 250-deg. F. and a surface temperature range of 150-deg. F.
- B. Sanitary Sealant: One-part mildew-resistant silicone; ASTM C920 Type S; Grade NS; Class 25; Uses NT, G, A and O; formulated with fungicide for sealing interior joints with nonporous substrates around ceramic tile, showers, sinks and plumbing fixtures; Dow Corning Corp. "786 Mildew Resistant", General Electric Co. "Sanitary 1700", Sonneborn Building Product Div. "Sonolastic Omniplus", Tremco Tremsil 200 or approved equal.
- C. Horizontal Joint Sealant: Two-part pourable urethane; ASTM C920, Type M; Grade P; Class 25; Uses T, M, A and O; Pecora Corp. "NR-200 Urexpan", Sonneborn "Sonolastic Paving Joint Sealant", Tremco, Inc. "THC-900/901" or approved equal. Horizontal joint sealant shall have a minimum Shore A hardness of 30.

#### 2.3 LATEX JOINT SEALANTS

- A. Interior Building Sealant: Acrylic-emulsion; one-part, nonsag, mildew-resistant, complying with ASTM C834, formulated to be paintable; Pecora Corp. "AC-20", Sonneborn "Sonolac", Tremco Inc. "Tremco Acrylic Latex 834" or approved equal.

#### 2.4 JOINT FILLERS FOR CONCRETE PAVING

- A. Joint Filler: Preformed cork strips complying with ASTM D1752 for Type II or preformed sponge rubber strips complying with ASTM D1752 for Type I.

#### 2.5 JOINT SEALANT BACKING

- A. General: Provide sealant backings which are non-staining; are compatible with joint substrates, sealants, primers and other joint fillers; and are approved by sealant manufacturer.
- B. Plastic Foam Joint-Fillers: Preformed, compressible, resilient, non-waxing, non-extruding strips of plastic foam, of size, shape and density to control sealant depth.
- C. Bond-Breaker Tape: Polyethylene tape or other plastic tape as recommended by sealant manufacturer. Provide self-adhesive tape where applicable.

# EXHIBIT C

## 2.6 MISCELLANEOUS MATERIALS

- A. Primer: As recommended by joint sealant manufacturer for adhesion of sealant to joint substrates.
- B. Cleaners for Nonporous Surfaces: Non-staining, chemical cleaner of type acceptable to manufacturer of sealant and sealant backing materials which are not harmful to substrates and adjacent nonporous materials.
- C. Masking Tape: Non-staining, non-absorbent type compatible with joint sealants and to surfaces adjacent to joints.

## PART 3 - EXECUTION

### 3.1 PREPARATION

- A. Surface Cleaning of Joints: Clean out joints immediately before installing joint sealants.
  - 1. Remove foreign material from joint substrates which could interfere with adhesion of joint sealant, including dust, paints, oil, grease, waterproofing, water repellents, water, and surface dirt.
  - 2. Clean porous surfaces, by brushing, grinding, blast cleaning, mechanical abrading, or acid washing to produce a clean, sound substrate. Remove loose particles remaining from cleaning operations by vacuuming or blowing out joints.
  - 3. Remove laitance and form release agents from concrete.
  - 4. Clean non-porous surfaces by chemical cleaners or other means which are not harmful to substrates or leave residues capable of interfering with adhesion of joint sealants.
- B. Joint Priming: Prime joint substrates where recommended by joint sealant manufacturer. Apply primer to comply with joint sealant manufacturer's recommendations. Confine primers to areas of joint sealant bond, do not allow spillage or migration onto adjoining surfaces.
- C. Masking Tape: Use masking tape where required to prevent contact of sealant with adjoining surfaces. Remove tape immediately after tooling without disturbing joint seal.

### 3.2 INSTALLATION OF JOINT SEALANTS

- A. General: Comply with joint sealant manufacturers' printed installation instructions applicable to products and applications indicated, except where more stringent requirements apply. Provide temporary ventilation during installation of interior joint sealants.
- B. Sealant Installation Standard: Comply with recommendations of ASTM C1193 for use of joint sealants as applicable to materials, applications and conditions indicated.
- C. Installation of Sealant Backings: Install sealant backings to comply with the following requirements:
  - 1. Install joint-fillers to provide sealant support for optimum performance cross-sectional shapes and depths.
    - a. Do not leave gaps between ends of joint-fillers.
    - b. Do not stretch, twist, puncture or tear joint-fillers.
    - c. Remove absorbent joint-fillers which have become wet prior to sealant application and replace with dry material.

# EXHIBIT C

## Joint Sealants Section 07 9200

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- 2. Install bond breaker tape between sealants and joint-fillers, compression seals or back of joints where required to prevent third-side adhesion of sealant to back of joint.
- D. Installation of Sealants: Install sealants by proven techniques to contact and fully wet joint substrates, completely filling recesses provided for each joint configuration and providing uniform, optimum performance cross-sectional shapes and depths.
- E. Tooling of Non-sag Sealants: Tool sealants to form smooth, uniform beads of slightly concave profile that is slightly below the adjacent surfaces unless otherwise indicated. Tool to eliminate air pockets and to ensure contact and adhesion of sealant with sides of joint. Remove excess sealants from surfaces adjacent to joint. Do not use tooling agents.

### 3.3 PROTECTION AND CLEANING

- A. Protect joint sealants during and after curing period from contact with contaminating substances or from damage.
- B. Cut out and remove damaged or deteriorated joint sealers and reseal joints with matching new materials.
- C. Clean off excess sealants or sealant smears adjacent to joints as work progresses by methods and with cleaning materials approved by sealant manufacturer.

### 3.4 FIELD QUALITY CONTROL

- A. Conduct field adhesion testing in accordance with ASTM C1521 with the sealant manufacturer's representative present. Conduct 10 tests in the first 1,000-feet of each sealant type and substrate followed by 1 test for every 1,000-feet thereafter if no test failure occurs.

**END OF SECTION 07 9200**

# EXHIBIT C

Metal Frames Section 08 1200

## METAL FRAMES SECTION 08 1200

### PART 1-GENERAL

#### 1.1 SUMMARY

- A. Description: Provide Steel Doors and Frames, as shown and specified per Contract documents.

#### 1.2 SUBMITTALS

- A. General: Refer to GENERAL CONDITIONS.
- B. Shop Drawings: Submit manufacture and installation details, including fastenings, for review. Shop details of each condition a 3 inch scale.
- C. Product Data: Submit manufacturer's specifications, data, and installation instructions for review.
- D. Test Reports: Refer to GENERAL CONDITIONS.
- E. Closeout:
  - 1. General: Refer to GENERAL CONDITIONS.
  - 2. Guarantee: Provide in required form for a period of one (1) year from date of final acceptance by Owner.

#### 1.3 QUALITY ASSURANCE

- A. General: Refer to GENERAL CONDITIONS.
- B. Reference Standards:
  - 1. General: Refer to Section GENERAL CONDITIONS for reference standards, applicable codes and definitions.
  - 2. American Society of Testing Materials (ASTM): Materials and testing standards as identified throughout this Section.
  - 3. American National Standards Institute (ANSI):
    - a. ANSI A117.1: Specifications for Making Buildings and Facilities Accessible to and Usable by Physically Handicapped People.
    - b. ANSI A250.8: Recommended Specifications for Standard Steel Doors and Frames.
  - 4. California State Fire Marshal (CSFM): Standard 12-7-4.
  - 5. Door Hardware Institute (DHI): Installation of Commercial Steel Doors and Steel Frames, Insulated Steel Doors in Wood Frames and Builder's Hardware.
  - 6. Steel Door Institute (SDI):
    - a. ANSI/SDI-100: Recommended Specifications for Standard Steel Doors and Frames.

# EXHIBIT C

## Metal Frames Section 08 1200

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- b. ANSI/SDI-105: Recommended Erection Instructions for Steel Frames.
- c. ANSI/SDI 117: Manufacturing Tolerances Standard Steel Doors and Frames.
- d. ANSI/SDI-250.6: Hardware on Steel Door (Reinforcement Application).
- 7. Underwriters Laboratories Inc. (UL): UL 10C, Fire Test for Door Assemblies.
- 8. Uniform Building Code (UBC): Standard 7-2.
- 9. American Welding Society: Standards for High Grade Hollow Metal Work.

## PART 2- PRODUCTS

### 2.1 MATERIALS

A. General: Refer to GENERAL CONDITIONS

B. Steel:

- 1. Sheet: ASTM A336 (CR) and A569 (hr), uncoated, pickled, and free from pits and defects. Use cold-rolled or hot-rolled for frames.
- 2. Galvanized Steel Sheets: Zinc-coated carbon steel complying with ASTM A 526, commercial quality, or ASTM A 642, drawing quality, hot-dip galvanized according to ASTM A 525, with A 60 or G60 coating designation, mill phosphatized.
- 3. Reinforcement: ASTM A36.

C. Fasteners: Galvanized or cadmium plated.

- 1. Bolts and Nuts: ASTM A307, Grade A.
- 2. Machine Screws: FS-FF-S-92, Type III cross-recessed, Design I or II recess, Style 2c flat head; carbon steel.

D. Silencers: Resilient rubber; manufacturer's standard.

E. Sealant: Refer to Section 07 9200 – JOINT SEALERS.

F. Primer: Refer to Section 09 9000 – PAINTING AND COATINGS.

### 2.2 MANUFACTURE:

A. General: Specified products are manufactured by the Ceco Door Products or approved equal.

B. Alternate Manufacturers: Comparable products manufactured by the Kewanee Co., or accepted equal.

C. Hardware Requirements: Prepare frames at factory to receive template hardware per final schedule; locate as specified under Section 08 7111 – DOOR HARDWARE. Provide reinforcements of specified thicknesses and sizes recommended by hardware manufacturer; hinge reinforcements not less than 10 gage and at least 9 inches long; reinforcement for lock strikes and closers not less than 12 gage; other mortised and countersunk items not less than 12 gage; surface applied items not less the 14 gage; provide reinforcement at heads of frames whether or not closers are indicated.

# EXHIBIT C

Metal Frames Section 08 1200

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D. Metal Frames:

1. Interior Frames: 16 gage

E. Finish: Baked primer.

2.3 FABRICATION:

A. Metal Frames:

1. Standard Frames: Fabricate frames as welded unit.
2. Reinforcement:
  - a. General: Reinforce frames wider than 48 inches with roll-formed steel channels fitted tightly into frame head, flush with top.
  - b. Hardware: Fabricate frames with reinforcing plates welded in place. Provide mortar guard boxes, where required.
3. Stops: Rolled steel shape, mitered corners, prepared for countersink style tamper proof screws. Provide replaceable closed-cell sponge neoprene gasket, thickness as recommended by manufacturer.
4. Silencers: Provide three (3) single silencers equally spaced on strike side of single door frames, and two (2) silencers on heads of double door frames.
5. Construction: Fabricate frames with mitered, coped or welded corners; header and jambs shall be secured at corners by internal welding of faces or by welding, exposed joints shall be neat and tight; provide temporary metal spreaders at bottom of welded frames to maintain rigidity.
6. Fastenings: Concealed

B. Anchors:

1. General: Fabricate 16 gage x 2 inch wide anchors of same material used for door frames.
2. Wood Stud Partitions: Wood stud anchors with perforations.
3. Locations: Provide three (3) anchors per door jamb; provide adjustable floor anchor at bottom of each door jamb; provide minimum of two (2) anchors at end of frames.

## PART 3- EXECUTION

3.1 PERFORMANCE

- A. General: Refer to GENERAL CONDITIONS.

3.2 PREPARATION

- A. Examination: Examine conditions of work in place before beginning work; report defects.
- B. Measurements: Take field measurements; report variance between plan and field dimensions.



# EXHIBIT C

## Metal Frames Section 08 1200

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- C. Protection: Protect metal surfaces after installation; any indication of deterioration, use or damage will be unacceptable.

### 3.3 INSTALLATION

- A. General: Install in conformance with reinforced standards, manufacturer's written directions, as shown, and as specified.
- B. Anchors:
  - 1. Jamb:
    - a. General: Position one (1) anchor above top butt reinforcement and one (1) anchor below bottom butt reinforcement; minimum four (4) anchors per jamb, 24 inches on center maximum.
    - b. Frames Set in Wood Stud Partitions: Weld anchors to frames; secure to wood studs with two (2) fasteners per anchor. Use two (2) No. 12x2-1/2 inch flathead screws, or two (2) 12d nails (wire anchors not accepted)
  - 2. Head: Provide minimum of two (2) anchors at frames over 2'-6" wide; 24 inches on center, maximum.
- C. Metal Frames:
  - 1. General: Set frames plumb, straight and square; align and securely brace until permanent anchors are set; use shims where required. Remove temporary braces after wall construction is completed.
  - 2. Door Frames: Where shown, provide overhead frame bracing; securely anchor to structure. Install roll-formed steel reinforcement channels between two abutting frames. Anchor to structure and floor.
  - 3. Sealant: Seal perimeter of frames and adjoining material per Section 07 9200 – JOINT SEALANTS.
- D. Finish: Touch-up factory applied baked primer; refer to Section 09 9000 – PAINTING AND COATING.

### 3.4 CLEANING

- A. General: At the Completion of work remove surplus materials, rubbish, and debris and thoroughly clean exposed surfaces.

END OF SECTION 08 1200

# EXHIBIT C

Interior Aluminum Frames Section 08 1216

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## INTERIOR ALUMINUM FRAMES

SECTION 08 4213

### PART 1 - GENERAL

#### 1.1 GENERAL

- A. The requirements of the General Conditions, Special Conditions, and Division 1 apply to the work of this Section.

#### 1.2 SUMMARY

- A. This Section includes the following:
  - 1. Interior aluminum frames for doors.
  - 2. Interior aluminum frames for glazing.
  - 3. Interior aluminum end caps for walls.

#### 1.3 RELATED SECTIONS

- A. Section 07 9200 "Joint Sealants" for joint sealants installed with interior aluminum frames and for sealants to the extent not specified in this Section.
- B. Section 08 1400 "Wood Doors" for wood doors installed in interior aluminum frames.
- C. Section 08 7111 "Door Hardware" for door hardware.
- D. Section 08 8000 "Glazing" for glass in interior aluminum frames.
- E. Section 09 2900 "Gypsum Board" for partitions.

#### 1.4 SUBMITTALS

- A. Product Data: Include construction details, material descriptions, dimensions of individual components and profiles, and finishes for each type of interior aluminum frame indicated.
- B. Shop Drawings: For interior aluminum frames. Include plans, elevations, sections, details, and attachments to other work.
- C. Samples for Verification: 12-inch- (300-mm-) long framing member with factory-applied finish for each type of interior aluminum frame indicated. Color as indicated within this section.
- D. Maintenance Data: For interior aluminum frames to include in maintenance manuals.

# EXHIBIT C

## Interior Aluminum Frames Section 08 1216

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### 1.5 QUALITY ASSURANCE

- A. Product Options: Drawings indicate size, profiles, and dimensional requirements of interior aluminum frames and are based on the specific system indicated.

## PART 2 - PRODUCTS

### 2.1 MANUFACTURERS

- A. Basis of Design Product: The design is based on interior aluminum frames manufactured by Oldcastle Glass Engineered Products, Inc, "Series 1000 Flush Glazed System, Center Set Aluminum Storefronts", system to accommodate 1/4" glass, 1 3/4" x 4 profile". Subject to compliance with requirements, provide the named product or a comparable product by one of the following manufactures:
  1. Custom Components Company.
  2. Dual Lock Partition Systems, Inc.
  3. Frameworks Manufacturing.
  4. Modulex, Inc.
  5. RACO Interior Products, Inc.
  6. Versatrac.
  7. Wilson Partitions.

### 2.2 COMPONENTS

- A. Aluminum Framing, General: ASTM B221, alloy 6063-T5 for extrusions; ASTM B209, alloy 5005-H16 for sheets; or other alloys and temper recommended by manufacturer appropriate for specified finish.
- B. Door Frames: Reinforced for hinges and strikes.
- C. Glazing Frames: For glazing thickness indicated.
- D. Wall End Caps: Mull-it-Over 60 Wide, aluminum wall end cap to match window system framing, with sound deadening composite, compressible gasket and snap covers, <https://www.mullitoverproducts.com>, or approved equal

### 2.3 ACCESSORIES

- A. Fasteners: Aluminum, nonmagnetic stainless-steel or other noncorrosive metal fasteners compatible with frames, stops, panels, reinforcement plates, hardware, anchors, and other items being fastened.
- B. Sound Seals: Manufacturer's standard continuous mohair, wool pile, or vinyl seals.
- C. Glazing Gaskets: Manufacturer's standard extruded or molded plastic, to accommodate glazing thickness indicated.

# EXHIBIT C

## Interior Aluminum Frames Section 08 1216

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- D. Glazing: Comply with requirements in Division 8 Section "Glazing."
- E. Hardware: Comply with requirements in Division 8 door hardware Sections.

### 2.4 FABRICATION

- A. Machine jambs and prepare for hardware, with concealed reinforcement plates, drilled and tapped as required, and fastened within frame with concealed screws.
- B. Provide concealed corner reinforcements and alignment clips for accurately fitted hairline joints at butted or mitered connections.
- C. Fabricate frames for glazing with removable stops to allow glazing replacement without dismantling frame.
- D. Fabricate all components to allow secure installation without exposed fasteners.

### 2.5 ALUMINUM FINISHES

- A. General: Comply with NAAMM's "Metal Finishes Manual for Architectural and Metal Products" for recommendations for applying and designating finishes.
- B. Finish designations prefixed by AA comply with the system established by the Aluminum Association for designating aluminum finishes.
- C. Clear Anodic Finish: AAMA 611, AA-M12C22A31, Class II, 0.04 mm or thicker.

## PART 3 - EXECUTION

### 3.1 EXAMINATION

- A. Examine walls, floors, and ceilings, with Installer present, for conditions affecting performance of work.
  - 1. Verify that wall thickness does not exceed standard tolerances allowed by throat size indicated.
  - 2. Proceed with installation only after unsatisfactory conditions have been corrected.

### 3.2 INSTALLATION

- A. Comply with frame manufacturer's written installation instructions.
- B. Install frames plumb and square, securely anchored to substrates.
- C. Install frame components in the longest possible lengths; components up to 72 inches (1830 mm) long must be 1 piece.
  - 1. Use concealed installation clips to produce tightly fitted and aligned splices and connections.
  - 2. Secure clips to main structural extrusion components and not to snap-in or trim members.

# EXHIBIT C

## Interior Aluminum Frames Section 08 1216

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3. Do not leave screws or other fasteners exposed to view when installation is complete.

### 3.3 CLEANING

- A. Clean exposed frame surfaces promptly after installation, using cleaning methods recommended by frame manufacturer and according to AAMA 609 & 610.
- B. Touch up marred frame surfaces so touchup is not visible from a distance of 24 inches (610 mm). Remove and replace frames with damaged finish that cannot be satisfactorily repaired.

**END OF SECTION 08 1216**

# EXHIBIT C

Wood Doors Section 08 1400

## WOOD DOORS SECTION 08 1400

### PART 1-GENERAL

#### 1.1 SUMMARY

A. Description: Provide Wood Doors, as shown and specified per Contract documents.

#### 1.2 SUBMITTALS

A. General: Refer to GENERAL CONDITIONS.

B. Samples: Provide samples of manufacturer's standard finish for species specified.

C. Product Data: Submit manufacturer's specifications, data, and installation instructions for review.

D. Certificates:

1. General: Submit WIC Certified Compliance Certificate for Installation.

2. Hardwood:

a. General: Submit certification and documentation verifying that hardwood lumber and veneers were obtained from sustainably managed sources and that certified lumber was properly segregated from other materials while in storage and production.

b. Acceptable Certifying Agencies:

a. Rainforest Alliance: "Smart Wood Program".

b. Scientific Certification Systems: "Forest Conservation Program".

E. Closeout:

1. General: Refer to GENERAL CONDITIONS.

2. Guarantee: Provide in required form for a period of two (2) years from date of final acceptance by Owner.

#### 1.3 QUALITY REQUIREMENTS

A. General: Refer to GENERAL CONDITIONS.

B. Reference Standards:

1. General: Refer to GENERAL CONDITIONS for reference standards, applicable codes and definitions.

2. National Wood Window and Door Association (NWWDA): NWWDA I.S.1A – Architectural Wood Flush Doors.

3. Underwriters Laboratories Inc. (UL): UL 10C, Fire Test for Door Assemblies.

4. Uniform Building Code (UBC): Standard 7-2.

# EXHIBIT C

Wood Doors Section 08 1400

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5. Woodwork Institute of California (WIC): Manual of Millwork; Section 20.

## PART 2- PRODUCTS

### 2.1 MATERIALS

A. General: Refer to GENERAL CONDITIONS.

B. Wood Doors:

1. General: WICMM Custom Grade, 5-ply, made up of face veneers, cross-banding, and core unit, or 7-ply made up of face veneers, cross-bands, back veneers, and core unit; securely bonded together by hot plate process.
2. Flush Type:
  - a. Interior: 1-3/4 inch thick, solid stock.
  - b. General Construction: Solid core; stain grade Birch veneer.
  - c. Adhesive: Type II water resistant adhesive for bonding core unit strips and edge banding.
  - d. Core: Bonded core filed may be particle board per ANSI A208.1 and CS 236-66, or any combination of blocks or strip, with end joints tight, well staggered in adjacent rows, and with blocks or strips securely edge glued together under pressure. No open spaces shall occur between core blocks or strips. No defects shall be allowed in core blocks or strips that show through face or materially affect the strength of the door.
  - e. Banding: Provide vertical edge bands, not less than 1.5 inch thick, any hardwood species closely matching face veneer in density and appearance. Securely glue edge bands to core. Provide top and bottom edge bands four (4) inches thick with hardwood edge band, any species having density same as core species. Top and bottom bands may be secured in place with machine joint. Biscuiting of vertical to horizontal edge bands for oversize doors is preferred.
  - f. Blocking: Provide solid blocking at all locations for mounting of hardware.
  - g. Finish: Manufacturer's standard finish as selected by Architect.

## PART 3- EXECUTION

### 3.1 PERFORMANCE

A. General: Refer to GENERAL CONDITIONS.

### 3.2 PREPARATION

- A. Examination: Examine conditions of work in place before beginning work; report defects. Verify that door frames are the type required for door and are properly installed. Install fire rated doors only in corresponding fire rated frames.
- B. Measurements: Take field measurements; report variance between plan and field dimensions.

# EXHIBIT C

## Wood Doors Section 08 1400

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### C. Delivery:

1. General: Pack and protect doors against damage during shipment and storage. Do not use packing materials that will stain or discolor door surface.
2. Storage: Per WIC Technical Bulletin No. 420-R for flush doors and No. 416-R for fire rated doors. Store materials under cover, in heated rooms and protected from damage, including exposure to excess humidity.

### 3.3 INSTALLATION

- A. General: Install in strict conformance with NFPA Pamphlet No. 80 "installation of Fir Doors", other referenced standards, the manufacturer's written directions, as shown, and as herein specified. Make manufacturer's instructions available to the inspecting authorities.
- B. Tolerances:
  1. General: Maximum distortion measured with straight edge or taught string, corner to corner, over an imaginary 36 inch x 84 inch surface area.
  2. Diagonal (Wrap), Vertical (Bow) and Width (Cup): 1/8 inch.
- C. Hardware: Per Section 08 7111 – DOOR HARDWARE. Fit doors to specified clearances; do not trim job fitted doors more than 1/4 inch from any edge.

### 3.4 CLEANING

- A. General: Upon completion, thoroughly clean exposed surfaces per manufacturer's instructions.

**END OF SECTION 08 1400**



# EXHIBIT C

Access Doors and Frames Section 08 3113

## ACCESS DOORS AND FRAMES SECTION 08 3113

### PART 1-GENERAL

#### 1.1 SUMMARY

- A. Description: Provide Access Doors and Frames, as shown and specified per Contract documents.

#### 1.2 SUBMITTALS

- A. General: Refer to GENERAL CONDITIONS.
- B. Product Data: Submit manufacturer's specifications, data, and installation instructions for review.
- C. Closeout:
  - 1. General: Refer to GENERAL CONDITIONS.
  - 2. Guarantee: Provide in required form for a period of one (1) year from date of final acceptance by Owner.

#### 1.3 QUALITY REQUIREMENTS

- A. General: Refer to GENERAL CONDITIONS.
- B. Labeled Door and Frames: Conform to requirements of State Fire Marshal Standard 12-7-4 and Underwriters Laboratory.
- C. Design Requirements: Exterior glazed frame member designed to withstand a wind load of 24 lbs. per square foot, minimum.
- D. Reference Standards:
  - 1. General: Refer to GENERAL CONDITIONS for reference standards, applicable codes and definitions.
  - 2. National Fire Protection Association (NFPA): Standards.
  - 3. Underwriters Laboratories Inc. (UL): Standards.

### PART 2- PRODUCTS

#### 2.1 MATERIALS

- A. General: Refer to GENERAL CONDITIONS
- B. Access Doors and Panels:
  - 1. General: Steel frame with continuous hinge, manufactured by Milcor LP
  - 2. Alternate Manufacturers: Comparable products manufactured by J. L. Industries, or accepted equal.

# EXHIBIT C

## Access Doors and Frames Section 08 3113

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3. Sizes: Minimum sizes shall be 16 inch by 16 inch for walls and 24 inch by 24 inch for ceilings, or as shown, or as required for specific equipment.
4. Materials:
  - a. Door and Trim: 14 gauge cold rolled steel
  - b. Return Frame: 16 gauge steel
  - c. Insulation: 1-7/8 inch thick mineral wool between 22 gauge steel.
  - d. Hinges: concealed continuous piano hinges to 180 degree opening.
  - e. Latches: Self-latching screwdriver locks.
3. Walls: Style M, with standard cam lock.
- C. Fasteners: As recommended by manufacturer.
- D. Primer: Rust inhibiting as recommended by the manufacturer.

### PART 3- EXECUTION

#### 3.1 PERFORMANCE

- A. General: Refer to GENERAL CONDITIONS.

#### 3.2 PREPARATION

- A. Examination: Examine conditions of work in place before beginning work; report defects.
- B. Measurements: Take field measurements; report variance between plan and field dimensions.

#### 3.3 INSTALLATION

- A. General: Install in conformance with referenced standards, manufacturer's written directions, as shown, and as specified.
- B. Access Panels: Locate access doors as required for access to and operation of mechanical and electrical devices, and as required to comply with all applicable codes regarding access to required conditions, valves, and related items that are concealed; see also Division 15 – MECHANICAL and Division 16 – ELECTRICAL.

#### 3.4 ADJUSTMENT

- A. General: Prior to acceptance, adjust moveable parts to assure smooth operation.

#### 3.5 CLEANING

- A. General: Upon completion, thoroughly clean exposed surfaces per manufacturer's instructions.

# EXHIBIT C

Access Doors and Frames Section 08 3113

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END OF SECTION 08 3113

# EXHIBIT C

Overhead Coiling Doors Section 08 3323

## OVERHEAD COILING DOORS SECTION 08 3323

### PART 1 - GENERAL

#### 1.1 GENERAL

- A. The requirements of the General Conditions, Special Conditions, and Division 1 apply to the work of this Section.

#### 1.2 DESCRIPTION

- A. This Section describes requirements for furnishing and installing the following:
  - 1. Motorize existing overhead coiling service door

#### 1.3 SUBMITTALS

- A. Product Data: Manufacturer's descriptive and technical data and illustrations.
- B. Shop Drawings: Show layouts, elevations, relationship to adjacent work, and anchorage details.
- C. Operating and Maintenance Instructions: Complete data for maintenance and operation.
- D. Warranty.

#### 1.4 QUALITY ASSURANCE

- A. Wind Loading: Design and reinforce exterior overhead service doors to withstand a 20-psf wind loading pressure without damage to door or assembly components in conformance with ASTM E330.
- B. Operation: Design door assembly, including operator, to operate for not less than 20,000 cycles.

#### 1.5 WARRANTY

- A. Warrant equipment to be free from defects in materials and workmanship for a period of 3-years from Date of Substantial Completion or 20,000 cycles, whichever occurs first. This warranty shall be in addition to and not a limitation of other rights the Owner may have against the Contractor under the Contract Documents.

### PART 2 - PRODUCTS

#### 2.1 COILING SERVICE DOOR MOTOR, CONTROLS, AND SENSING EDGE

- A. Approved Manufacturer and Installer: Cornell Safe and Secure Weather Gard Service Door, installation by The Smith Company Inc., Roseville, CA (916)772-3777, contact Greg Boom, [gregboom@smithcodoors.com](mailto:gregboom@smithcodoors.com), (916)772-3777
- B. Overhead Door Motor: Cornell MG Operator designed for Standard Duty Use, industrial gear head operator, model as recommended by installer for size of existing door
  - 1. Operation: Door shall be operated at a speed of 2/3-feet per second by an open drip-proof electric motor with gear reducer in oil bath. The motor operator shall include a geared limit switch, and an electrically interlocked emergency chain operator. The motor starter shall be housed in a NEMA 1 housing and include a magnetic reversing starter, a 24-volt control transformer, and complete terminal strip to facilitate field wiring. The motor operator shall be activated by a keyed push-button station in a NEMA 1 enclosure and by key fob. The motor shall be size as recommended by door manufacturer, 115-volts, single phase. The motor

# EXHIBIT C

## Overhead Coiling Doors Section 08 3323

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operator shall be mounted to the door bracket and shall be UL listed.

- C. Safety Edge: Provide a safety edge system with the following features:
  - 1. The safety edge shall be installed on the bottom bar of the door and shall automatically reverse the door if the device detects an obstruction in the downward travel of the door.
  - 2. The safety edge shall consist of a rubber boot attached below the bottom bar with an electrical switch secured to the back of the bottom bar. The safety edge shall operate with air wave technology and shall not rely on pneumatic pressure or electrical strip contacts to operate properly. The safety edge shall create an air wave that shall be detected and reverse the direction of the door.
  - 3. The operation of the safety edge shall not be subject to interferences by temperature, barometric pressure, water infiltration, or cuts in the rubber boot.
  - 4. The safety edge shall be connected to the motor operator with a coil cord.
- D. Operating Controls: manufacturers standard operating controls

### PART 3 - EXECUTION

#### 3.1 INSTALLATION

- A. Install equipment with necessary hardware, anchors, inserts, hangers, and equipment supports in accordance with manufacturer's instructions and as specified.
- B. Upon completion, lubricate, test and adjust door to operate easily, free from warp, twist or distortion, and fitting weathertight.
- C. Train Owner's maintenance personnel on procedures and schedules related to door operation, servicing, and preventative maintenance.

**END OF SECTION 08 3323**

# EXHIBIT C

Door Hardware Section 08 7111

## DOOR HARDWARE SECTION 08 7111

### PART 1-GENERAL

#### 1.1 SUMMARY

A. Description: Provide Door Hardware, as shown and specified per Contract documents.

#### 1.2 SUBMITTALS

A. General: Refer to GENERAL CONDITIONS.

B. Preparer Identification: Identify preparer of Hardware Submittal on cover of submittals, including contact information.

C. Hardware Schedule:

1. General: Submit detailed finish hardware schedule in vertical format. Reference headings to hardware groups specified and indicate door type, or mark; describe location, hand, size, door and frame material. Organize doors with identical hardware groups under on headings as identified in the contract documents.

D. Manufacturers List:

1. General: List manufacturer's name and product numbers for items used in hardware schedule.

2. Product Source: Furnish each type of lock and latchset from a single manufacturer, unless more than one (1) manufacturer's products are specified.

E. Samples:

1. General: If specifically requested for specified products; required for alternate products.

2. Substitutions Requested: Refer to GENERAL CONDITIONS. Submit schedule and sample of each item proposed for substitution. Clearly mark each sample indicating type of item, manufacturer's name, catalog number and item for which it is proposed to be substituted.

3. Disposition: Accepted samples may be used in work; rejected samples will be returned.

F. Product Data: Submit manufacturer's specifications, data, and installation instructions for review.

G. Closeout:

1. General: Refer to GENERAL CONDITIONS.

2. Maintenance Data: Manufacturer's instructions.

3. Guarantee:

a. Provide in required form for a period of one (1) year from date of final acceptance by Owner.

b. Door Closers: Ten (10) years.

# EXHIBIT C

Door Hardware Section 08 7111

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## 1.3 QUALITY REQUIREMENTS

A. General: Refer to GENERAL CONDITIONS.

B. Reference Standards:

1. General: Refer to GENERAL CONDITIONS for reference standards, applicable codes and definitions.
2. Americans with Disabilities Act (ADA): Accessibility standards.
3. American National Standards Institute (ANSI): ANSI A117.1 and the California Code of Regulations, Title 24.
4. American Woodwork Institute (AWI): Quality standards.
5. Builders' Hardware Manufacturers Association (BHMA): Hardware standards.
6. Door and Hardware Institute (DHI): Hardware standards.
7. National Fire Protection Association (NFPA): NFPA 80, 101, and 252.
8. Underwriters Laboratories Inc. (UL): UL 10B and 305.
9. Uniform Building Code (UBC): Standard 7-2.
10. Woodwork Institute of California (WIC): Manual of Millwork.

C. Qualifications:

1. Manufacturers: Specializing in production of institutional and commercial door hardware for a minimum of five (5) years.
2. Supplier: A firm specializing in the supply and servicing of institutional and commercial door hardware for at least five (5) years.

D. Coordination:

1. General: Apply hardware to aluminum or metal frames, and factory prepared wood doors and frames, to template; provide two (2) copies of accepted Finish Hardware Schedule for use by door and frame suppliers.

## PART 2- PRODUCTS

### 2.1 MATERIALS

A. General: Refer to GENERAL CONDITIONS

# EXHIBIT C

## Door Hardware Section 08 7111

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### B. Products:

#### 1. Butts and Hinges:

- a. All butts shall have security lugs and non-removable pins for exterior doors. All butts for doors shall be ball or oilite bearing unless otherwise indicated.
- b. Screws: Provide Phillips flat-head screws complying with the following requirements:
  1. For frames install machine screws into drilled and tapped holes.
  2. Finish screw heads shall match surface of hinges or pivots.
- c. Hinge Pins: Except as otherwise indicated, provide hinge pins as follows:
  1. Out-Swing Exterior Doors: Non-removable pins.
  2. Out-Swing Corridor Doors with Locks: Non-removable pins.
  3. Interior Doors: Non-rising pins.
  4. Tips: Flat button and matching plug, finished to match leaves.
- d. Size: Unless otherwise indicated, determine size of the butts as follows:
  1. Doors 1-3/4 inch thick up to 3'-0" wide: 4-1/2 inch butts.
  2. Doors 1-3/4 inch thick over 3'-0" wide: 5 inch butts.
- e. Clearance: Provide butts of proper width to clear trim in projection to allow 180 degree swing.
- f. Number of Hinges: Furnish three butts for each door leaf up to 7'-0" high. Furnish an additional butt for each 2'-0" of door height over 7'-0".

#### 2. Closers:

- a. Closers shall be by LCN only, series 40 (in-swing) or 41 (out-swing). Provide 180 degree opening where possible. Provide parallel arms with jamb attachment for all out-swinging doors; match finish color of door hardware.
- b. All closers to have hold/open capabilities

#### 3. Floor stops: Shall be provided at all doors.

#### 4. Weatherstripping and Seals

- a. Provide continuous light or sound seals on interior doors. Provide noncorrosive fasteners for exterior applications and elsewhere as indicated.
- b. Replaceable Seal Strips shall be employed only where resilient or flexible seal strip is easily replaceable and readily available from stocks maintained by manufacturer over a 15 year period.

#### 5. Thresholds:

- a. Provide units not less than 4 inches wide, ADA compliant 1/2 inch total maximum rise in finished floor surface, see hardware groups, details, and drawings for profiles and locations

#### 6. Kick Plates:

- a. Pemko KA0050 SS, 16" x 34"



# EXHIBIT C

## Door Hardware Section 08 7111

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### 7. Screws, Bolts, and Fastening Devices:

- a. Exposed head oval Phillips type in countersunk holes. All screws and fasteners shall match finish and application of hardware.

### 8. Card Readers:

- a. Kantech P325XSF Single Gang ioProx Proximity Reader

### C. Finishes

1. General: All finishes shall be US26B, Brushed Chrome (626), unless otherwise noted.

## PART 3- EXECUTION

### 3.1 PREPARATION

- A. Examination: Examine conditions of work in place before beginning work; report defects.
- B. Measurements: Take field measurements; report variance between plan and field dimensions.
- C. Delivery:
  1. Packaging: Identify door number, hardware type, location and hand of door on each package.
  2. Keys: Label and deliver keys by registered mail or personal messenger directly to Architect.

### 3.2 APPLICATION

- A. General: Install in conformance with referenced standards, manufacturer's written directions, as shown, and as herein specified.
- B. Hardware Placement:
  1. General: Except for hinges, do not install hardware prior to completion of painting and finishing work. Coordinate locations of hardware at each door to provide a fully functional and operating system. Should any mounting heights or requirements listed herein conflict in the instructions to complete a fully functioning and operable door and hardware system, notify the architect prior to proceeding with ordering or installing doors and hardware. Unless otherwise shown, place hardware at following height above finish floor:
    2. Strike (Centerline) for Locks and Latches: 36 inches.
    3. Hinges: Manufacturer's standard.
    4. Door Pull (Centerline): 36 inches.
    5. Push Plate (Centerline): 36 inches.
    6. Deadlock (Centerline of Cylinder): 32 to 40 inches.
- C. Floor Clearances:
  2. No Threshold: 5/8 inch maximum for wood doors.

# EXHIBIT C

Door Hardware Section 08 7111

3. Threshold: 1/8 inch typical.
4. Carpet: 1/8 inch over top of nap, unless otherwise shown.

D. Installation:

1. General: Install hardware in precise manner; door clearance and hardware placement as specified. Predrill pilot holes in wood for screws. Drill and tap for surface mounted hardware on metal.
2. Hinges: Set hinge leaves snug and flat in mortises; turn screws to flat seat (do not drive). Drive hinge pins down and tighten set screws.
3. Closers: Mount door closers for maximum swing of door before setting stops.
4. Silencers: Set in place before adjusting strikes.
5. Locksets: Install locks with keyways in proper position; leaves, roses and escutcheons firmly attached.
6. Thresholds: Set in waterproof sealant; secure with lead shields and countersunk screws of same finish as threshold.

### 3.3 ADJUSTMENT AND MAINTENANCE

- A. General: Prior to acceptance, adjust moveable parts to assure smooth operation.
- B. Door Closers: Adjust for closing speed, latching speed, back checking, and hold-open devices for full control of door. Adjust operation of doors to require a maximum of 5 lbs. for exterior doors and 5.0 lbs. for interior doors. Adjust the sweep period of the closer such that from an open position of 70 degrees, the door will take at least 3 seconds to move to a point 3 inches from the latch, measured to the leading edge of the door.

### 3.4 CLEANING

- A. General: Upon completion, thoroughly clean exposed surfaces per manufacturer's instructions.

### 3.5 SCHEDULE

A. Hardware Group:

Group #1 at existing storefront door

- 1 card reader, Kantech P325XSF
- 1 electric strike, Rutherford 0161 series
- 1 power supply
- 1 power transfer
- 1 lockset

Group #2

- |                  |         |                      |
|------------------|---------|----------------------|
| 2pr butts        | Ives    | 5BB1 4.5 X 4.5 X 626 |
| 1 lockset        | Schlage | ND53PD X RHO X 626   |
| 1 floor stop     | Trimco  | 1209 x 626           |
| 1 perimeter seal | Pemko   | S88GR                |

# EXHIBIT C

Door Hardware Section 08 7111

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## Group #3

2pr butts	Ives	5BB1 4.5 X 4.5 X 626
1 lockset	Schlage	ND53PD X RHO X 626
1 card reader	Kantech	P325XSF
1 power supply		
1 power transfer		
1 electric strike	HES	8000 X 803 X 626
1 closer	Dorma	8916 AF89P X gray
1 floor stop	Trimco	1209 x 626
1 perimeter seal	Pemko	S88GR

## Group #4

2pr butts	Ives	5BB1 4.5 X 4.5 X 626
1 lockset	Schlage	ND40S X RHO X 626
1 closer	Dorma	8916 AF89P X gray
1 floor stop	Trimco	1209 x 626
1 perimeter seal	Pemko	S88GR

## Group #5

2pr butts	Ives	5BB1 4.5 X 4.5 X 626
1 locking panic	Von Duprin	98/99L-NL X RHO X 626
1 closer	Dorma	8916-DS X gray
1 goose neck stop	Ives	FS442 X 626
1 perimeter seal	Zero	8303AA
1 door bottom	Zero	8197AA
1 rain drip	Zero	
Threshold	existing	142AA

## Group 6

2pr butts	Ives	5BB1 4.5 X 4.5 X 626
1 Cylinder	Schlage	L460 with interior thumb turn, to match existing system

END OF SECTION 08 7111

# EXHIBIT C

Glazing Section 08 8000

## GLAZING SECTION 08 8000

### PART 1-GENERAL

#### 1.1 SUMMARY

A. Description: Provide Glass and Glazing, as shown and specified per Contract documents.

#### 1.2 SUBMITTALS

A. General: Refer to GENERAL CONDITIONS.

B. Shop Drawings: Submit list of materials proposed for use; identify each glazing condition.

C. Samples: If specifically requested.

D. Product Data: Submit manufacturer's specifications, data, and installation instructions for review.

E. Certificates: Certify that products installed comply with U.S. Consumer Product Safety Commission Standards, or show that standards do not apply.

F. Closeout:

1. General: Refer to GENERAL CONDITIONS.

2. Maintenance Data: Manufacturer's instructions.

3. Guarantee:

a. General: Provide in required form for stated period from date of final acceptance by Owner.

b. Float Glass: Per requirements of ASTM C1036 and ASTM C1048.

#### 1.3 QUALITY REQUIREMENTS

A. General: Refer to GENERAL CONDITIONS.

B. Reference Standards:

1. General: Refer to GENERAL CONDITIONS for reference standards, applicable codes and definitions.

2. American National Standards Institute (ANSI):

a. ANSI Z97.1: Safety Performance Specifications and Methods of Test or Safety Glazing Used in Buildings.

3. Flat Glass Marketing Association (FGMA): "Glazing Manual" and "Glazing Sealing Systems Manual".

4. Glass Association of North America (GANA): "Engineering Standards Manual" and "Glazing Manual".

# EXHIBIT C

Glazing Section 08 8000

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## PART 2- PRODUCTS

### 2.1 MATERIALS

A. General: Refer to GENERAL CONDITIONS

B. Manufacture:

1. General: Manufactured by Vitro Architectural Glass, Guardian Industries, AFGD Glass, Pilkington Glass Ltd, or approved equal
3. Tempered Glass and Safety Glazing: Comply with United States Consumer Product Safety Commission's "Safety Standards for Architectural Glazing Materials" (16 CFR part 1201) category I or II, as applicable; CBC Standard 24-2 and Section 240A and 2406.

C. Flat Glass:

1. General: Clear 1/4 inch thick unless otherwise indicated; size as shown.
2. Float Glass: ASTM C1036, Type 1 transparent flat, Class 1 clear, quality q3 glazing select.
3. Tempered Glass: ASTM C1048, fully tempered with horizontal tempering; 1/4 inch thick.

D. Glazing Materials:

1. General: Factory mixed materials recommended by glass manufacturer for each glazing condition. Provide glazing and bedding putties to match color of frame sealants, tapes, and other materials necessary to perform glazing work. Provide setting blocks, shims, compression seals, felt and neoprene or vinyl glazing channels as required.
2. Butyl Glazing Tape:
  - a. General: 1202T as manufactured by 3M Construction Markets.
  - b. Alternate Manufacturers: Comparable products manufactured by the Pecora Corp., or accepted equal.

E. Accessories:

1. General: Materials recommended by glass or glazing material manufacturer.
2. Setting Blocks and Spacers: Neoprene chemically compatible with specified sealants.
3. Glazing Points and Spring Wire Clips: Corrosion resistant.
4. Filler Rod: Compressible synthetic rubber or foam.
5. Prime-Sealers and Cleaners: As recommended by glass manufacturer.

# EXHIBIT C

Glazing Section 08 8000

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## PART 3- EXECUTION

### 3.1 PERFORMANCE

- A. General: Refer to GENERAL CONDITIONS

### 3.2 PREPARATION

- A. Environmental Requirements: Glaze in dry conditions; minimum temperature 40 degrees F during and 48 hours after installation of glazing compounds.
- B. Examination: Examine conditions of work in place before beginning work; report defects.
- C. Measurements: Take field measurements; report variance between plan and field dimensions.
- D. Delivery: Deliver with manufacture's labels intact; do not remove until completion of final inspection.
- E. Protection: Protect glass from damage until occupancy of building; replace glass damaged or broken before final acceptance.
- F. Surface Preparation: Clean contact surfaces with solvent and wipe dry. Seal porous glazing channels or recesses with material compatible with sealer. Prime surfaces scheduled to receive sealant.

### 3.3 INSTALLATION

- A. General: Install in conformance with referenced standards, manufacturer's written directions, as shown, and as specified.
- B. Glass:
  - 1. Dimensions: As shown; tolerances as recommended by manufacturer.
  - 2. Edges: Per referenced standards; nipped edges, or edges treated with abrasives, not acceptable.
- C. Glazing:
  - 1. General: Use glass as shown; glaze with glazing compound or glazing gaskets as required.
  - 2. Float Glass: Type and thickness, as shown.
  - 3. Tempered Glass: Type and thickness, as shown.

### 3.4 CLEANING

- A. General: At the completion of work remove surplus materials, rubbish, debris, and thoroughly clean exposed surfaces per manufacturer's instructions.

END OF SECTION 08 8000

# EXHIBIT C

Gypsum Board Section 09 2900

## GYPSUM BOARD SECTION 09 2900

### PART 1-GENERAL

#### 1.1 SUMMARY

- A. Description: Provide Gypsum Board, as shown and specified per Contract documents.

#### 1.2 SUBMITTALS

- A. General: Refer to GENERAL CONDITIONS
- B. Samples: If specifically requested.
- C. Product Data: Submit manufacturer's specifications, data, and installation instructions for review.
- D. Closeout:
  - 1. General: Refer to GENERAL CONDITIONS
  - 2. Guarantee: Provide in required form for a period of two (2) years from date of final acceptance by Owner.

#### 1.3 QUALITY REQUIREMENTS

- A. General: Refer to GENERAL CONDITIONS
- B. Reference Standards:
  - 1. General: Refer to GENERAL CONDITIONS for reference standards, applicable codes and definitions.
  - 2. American Society of Testing Materials (ASTM): Materials and testing standards as identified throughout this Section.
  - 3. Gypsum Association (GA):
    - a. GA-216: Recommended Specifications for the Application and Finishing of Gypsum Board.
    - b. GA-600: Fire Resistance Design Manual.
  - 4. Western Lath, Plaster and Drywall Industries Association (WLDIA): Reference Specifications.
  - 5. Underwriters Laboratory (UL): Fire Resistance Directory and Building Material Directory.
- C. Qualifications: Installer specializing in the work of this Section with minimum three (3) years documented experience.

# EXHIBIT C

Gypsum Board Section 09 2900

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## PART 2- PRODUCTS

### 2.1 MATERIALS

A. General: Refer to GENERAL CONDITIONS

B. Approved Manufactures: United States Gypsum, CertainTeed Gypsum, Incl, Georgia Pacific, National Gypsum Company or approved equal.

C. Gypsum Wallboard:

1. General: ASTM C36; taped edge where joint finish is required; 5/8 inch thickness, unless otherwise shown. Provide thicknesses or layers to flush with existing conditions, if more or less than 5/8 inch.
2. Mold- and Moisture-Resistant Gypsum Board: United States Gypsum "Sheetrock Mold Tough", CertainTeed Gypsum, Inc. "ProRoc Moisture and Mold Resistant with M2TECH", or approved equal non combustible, moisture- and mold-resistant gypsum core encased in moisture- and mold-resistant, 100-percent recycled face and back papers. Panels shall have a tapered long edge.
  - a. Mold Resistance: Panel score of 10 when tested in accordance with ASTM D3273
  - b. Thickness: 5/8 inch thickness, unless otherwise shown.
  - c. Ceiling Type: Mold- and Moisture-Resistant Gypsum Board, manufactured to have more sag resistance than regular-type gypsum board; long edges tapered, 5/8 inch thickness, unless otherwise shown.

D. Corner Beads and Casing:

1. General: Galvanized steel, Dur-A-Bead No. 103 at exterior corners and No. 200B L-shaped casing without back flange. Use of corner trim with paper flanges shall not be allowed.
2. Reveal: Trim-Tex Deflection Bead, Trim-Tex stock no. 9220

E. Joint System Materials:

1. General: ASTM C475.
2. Tape: Perf-A-Tape reinforcement.
3. Joint Compound: Brand Joint Compound – Taping.
4. Joint Finishing Compound: Brand Joint Compound – Topping.
5. Texture: Multi-purpose Texture Finish.

F. Interior Wall Sealant:

1. General: Acoustical Sealant as manufactured by Tremco, Inc.
2. Alternate Manufacturers: Comparable products manufactured by the Pecora Chemical Corp., or accepted equal.

G. Fasteners:

1. Fasteners to Wood Members:



# EXHIBIT C

Gypsum Board Section 09 2900

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- a. General: Manufactured by the U.S. Steel Group Unit of USX Corp.
- b. Alternate Manufacturers: Comparable products manufactured by the United States Gypsum Co., or accepted equal.
- c. Screws: Type W drywall screws.

## PART 3- EXECUTION

### 3.1 PERFORMANCE

- A. General: Refer to GENERAL CONDITIONS.

### 3.2 PREPARATION

- A. Environmental Requirements: Do not install wallboard or joint compounds if building temperature is below 55 degrees F. Provide proper ventilation to eliminate excessive moisture from building.
- B. Examination: Examine conditions of work in place before beginning work; report defects.
- C. Measurements: Take field measurements; report variance between plan and field dimensions.
- D. Protection: Avoid exposure to weather; use protective covering. Protect from soiling and construction damage.

### 3.3 INSTALLATION

- A. General: Install in conformance with referenced standards, manufacturer's written directions, as shown, and as specified.
- B. Rated Assemblies: Per UL and code requirements. Use only one manufacturer's products in the fabrication of each assembly, unless otherwise permitted by code.
- C. Gypsum Wallboard:
  1. Sheet Arrangement Layout: Install as shown; use long sheets to restrict joints to minimum.
  2. Cutting and Scribing: Cut neatly to fit around outlets, switch boxes and other protrusions.
  3. Joints: Butt sheets loosely together with tapered edges placed together; butt edges placed next to tapered edges are not acceptable. Sand or kerf cut edges and mill ends to provide smooth jointing on exposed face. Stagger end joints. Shim wallboard as required to provide even joints, without offsets.
  4. Fasteners:
    1. General: Finish joints, fastener depressions, applied metal trim and surface blemishes per manufacturer's directions.
    2. Finished Wallboard: Sand as necessary to provide flat, smooth surface ready for decoration.
    3. Concealed Wallboard: Wallboard covered by panels or wall-fastened casework, and wallboard above level of finished ceiling, does need to be sanded smooth.

# EXHIBIT C

## Gypsum Board Section 09 2900

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5. Textured Surfaces:
  - a. Provide a Level 5 finish throughout.
  - b. Provide an in-place sample of finished installation, 8 feet by 8 feet, for approval prior to proceeding with finishing. Approved accepted sample may remain in place.
6. Tolerances:
  - a. General: Refer to GENERAL CONDITIONS.
  - b. Maximum Variation: 1/8 inch in 10'-0" in any direction.

### 3.4 CLEANING

- A. General: Keep premises free from accumulation of waste and rubbish. At the completion of work remove surplus materials, rubbish, and debris.

**END OF SECTION 09 2900**

# EXHIBIT C

Tile Section 09 3000

## TILE SECTION 09 3000

### PART 1 - GENERAL

#### 1.1 GENERAL

- A. The requirements of the General Conditions, Special Conditions, and Division 1 apply to the work of this Section.

#### 1.2 DESCRIPTION

- A. This Section describes the requirements for furnishing and installing the following:

1. Wall tile.
2. Backsplash tile.
2. Floor tile.
3. Tiling Accessories

#### 1.3 SUBMITTALS

- A. General: GENERAL CONDITIONS
- B. Product Data: Furnish manufacturer's product data for each specified product.
- C. Shop Drawings: Show tile patterns and locations and widths of expansion, contraction, and isolation joints in tile substrates and finished tile surfaces.
- D. Samples for Verification: Furnish samples of the following items. Where products involve color and texture variations, furnish sets showing full range of variations expected.
  1. Each type and composition of tile for each color and texture required, at least 12-inches square, mounted on plywood or hardboard backing and grouted.
  2. Full-size units of each type of trim and accessory for each color required.
  3. Metal transition strips in 6-inch lengths.

#### 1.4 QUALITY ASSURANCE

- A. Single-Source Responsibility for Tile: Obtain each color, grade, finish, type, and variety of tile from a single source with resources to provide products of consistent quality in appearance without delaying progress of the work.
- B. Single-Source Responsibility for Setting and Grouting Materials: Obtain ingredients of a uniform quality from one manufacturer for each cementitious and admixture component and from one source or producer for each aggregate.
- C. Installer's Qualifications: A minimum of 3-years experience installing ceramic tile of the types specified, and a minimum of 5 installations of a magnitude similar to or larger than the work of this Section.
- D. Floor tile shall have a minimum dynamic coefficient of friction (DCOF) of 0.42 determined in accordance with ANSI 137.1-2012.

#### 1.5 PRODUCT DELIVERY, STORAGE, AND HANDLING

# EXHIBIT C

## Tile Section 09 3000

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- A. General: GENERAL CONDITIONS
- B. Deliver and store packaged materials in original containers with seals unbroken and labels intact until time of use. Comply with ANSI A137.1 for labeling sealed tile packages.
- C. Prevent damage or contamination to materials by water, freezing, foreign matter, and other causes.

### 1.6 PROJECT CONDITIONS

- A. Maintain environmental conditions and protect work during and after installation to comply with referenced standards and manufacturer's printed recommendations.
- B. Maintain temperatures at 50-deg. F. or more in tiled areas during installation and for 7-days after completion, unless higher temperatures are required by referenced installation standard or manufacturer's instructions.

### 1.7 EXTRA MATERIALS

- A. Furnish additional tile for replacement and maintenance, at the rate of approximately 3-percent, to the nearest full carton, for each size, color, pattern, and type installed. Identify each carton as to contents.

## PART 2 - PRODUCTS

### 2.1 TILE MATERIALS

- A. Wall Tile: Daltile glazed matte 2-inch x 2-inch keystones, color Desert Gray D014
- B. Wall Tile Accent: Daltile glazed matte 2-inch x 2-inch keystones, color Brownberry D118
- C. Backsplash Tile: Daltile 4x4 Matte, Color Price Group 2, as selected by Architect
- D. Floor Tile, Floor Cove and Wall Tile: DalTile matte 2-inch x 2-inch Keystones, color Artisan Brown Speckle D204, as shown on interior elevations
- E. Trim Units: Provide trim units to match adjoining flat tile.
  - 1. Size: Coordinate with sizes and coursing of adjoining flat tile.
  - 2. Shapes:
    - a. External Corners for Mortar-Set Tile: Bullnose.
    - b. External Corners for Thin-Set Tile: Surface bullnose.
    - c. Internal Corners: Field-buttet square corners.
    - d. Cove base: coved inside corner at floor to wall transition

### 2.2 SETTING MATERIALS

- A. Portland Cement: ASTM C150, Type I.
- B. Sand: ASTM C144.
- C. Hydrated Lime: ASTM C206 or C207, Type S.
- D. Water: Clean, clear, potable.
- E. Reinforcing:

# EXHIBIT C

## Tile Section 09 3000

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1. Floors: Galvanized welded wire fabric, 2-inches x 2-inches - W0.3 x W0.3 (16 ASW gage or 0.0625-inch diameter).
  2. Walls: Minimum 3.4-pounds per square yard galvanized expanded metal lath.
- F. Mortar:
1. Cement Mortar: Job mixed, portland cement, sand, water, and hydrated lime at Contractor's option, proportions specified in ANSI A108.1.
  2. Dry-Set Mortar: ANSI A118.1.
  3. Latex Portland-Cement Mortar: ANSI A118.4.
- G. Scratch Coat: Job mixed, portland cement, sand, water, and hydrated lime at Contractor's option, proportions specified in the applicable referenced TCA and ANSI standards.
- H. Bond Coat: Portland cement paste on a plastic setting bed, or dry-set or latex-portland cement mortar on a cured setting bed, except where any one type is specified in referenced TCA installation method.

### 2.3 GROUTING MATERIALS

- A. Commercial Portland Cement Grout: ANSI A118.6, color as selected by the Architect.
- B. Dry-Set Grout: ANSI A118.6, color grey
- C. Latex-Portland Cement Grout: ANSI A118.6, color grey
- D. Chemical-Resistant Epoxy Grout: ANSI A118.3, color grey
- E. Grout Schedule:
  1. Wall Tile: Commercial portland cement, dry-set, or latex-portland cement.
  2. Floor Tile: Commercial portland cement, sand-portland cement, dry-set, latex-portland cement or epoxy.
  3. Shower Floors: Epoxy.

### 2.4 MISCELLANEOUS MATERIALS

- A. Metal Transition Strips: Schlueter profiles as indicated on drawings. Where profile is not indicated, provide a submittal for the proposed profile for approval.
- B. Sealer: As recommended by tile and grout manufacturers.
- C. Curing Cover: 40-pound kraft membrane.
- D. Elastomeric Sheet Waterproofing: As specified in Section 07 1353.

## PART 3 - EXECUTION

### 3.1 INSPECTION

- A. Examine substrates and areas where tile will be installed, with installer present, for compliance with requirements for installation tolerances and other conditions affecting performance of installed tile.
  1. Verify that substrates for setting tile are firm, dry, clean, and free from oil or waxy films and curing compounds.

# EXHIBIT C

## Tile Section 09 3000

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2. Verify that installation of grounds, anchors, recessed frames, electrical and mechanical units of work, and similar items located in or behind tile has been completed before installing tile.

### 3.2 PREPARATION

- A. Blending: For tile exhibiting color variations within the range selected, verify that tile has been blended in factory and packaged accordingly so that tile units taken from one package show the same range in colors as those taken from other packages and match approved samples. If not factory blended, either return to manufacturer or blend tiles at Project site before installing.

### 3.3 INSTALLATION, GENERAL

- A. General: Install tile materials in accordance with tile manufacturer's instructions and recommendations. Provide additional tile setting materials, including but not limited to crack isolation membrane, where recommended by tile manufacturer.
- B. ANSI Tile Installation Standard: Comply with referenced parts of ANSI 108 series of tile installation standards.
- C. TCNA Installation Guidelines: Comply with TCNA "Handbook for Ceramic Tile Installation" installation methods referenced.
- D. Extend tile work into recesses and under or behind equipment and fixtures to form a complete covering without interruptions except as otherwise indicated. Terminate work neatly at obstructions, edges, and corners without disrupting pattern or joint alignments.
- E. Accurately form intersections and returns. Perform cutting and drilling of tile without marring visible surfaces. Carefully grind cut edges of tile abutting trim, finish, or built-in items for straight aligned joints. Fit tile closely to electrical outlets, piping, fixtures, and other penetrations so that plates, collars or covers overlap tile.
- F. Jointing Pattern at Floors: Unless otherwise indicated, lay tile in grid pattern. Align joints when adjoining tiles on floor, base, walls, and trim are same size. Lay out tile work and center tile fields in both directions in each space or on each wall area. Adjust to minimize tile cutting. Provide uniform joint widths unless otherwise indicated.
  1. For tile mounted in sheets, make joints between tile sheets same width as joints within tile sheets so that extent of each sheet is not apparent in finished work.
- G. Jointing Pattern at Walls: Unless otherwise indicated, lay tile in running bond. Align joints when adjoining tiles on floor, base, walls, and trim are same size. Lay out tile work and center tile fields in both directions in each space or on each wall area. Adjust to minimize tile cutting. Provide uniform joint widths unless otherwise indicated.
  1. For tile mounted in sheets, make joints between tile sheets same width as joints within tile sheets so that extent of each sheet is not apparent in finished work.
- H. Lay out tile wainscots to next full tile beyond dimensions indicated.
- I. Expansion Joints: Locate expansion joints and other sealant-filled joints, including control, contraction, and isolation joints during installation of setting materials, mortar beds, and tile. Do not saw cut joints after installation of tiles.
  1. Locate joints in tile surfaces directly above joints in concrete substrates.
  2. Prepare joints and apply sealants as specified in Section 07 9200.

### 3.4 TILE INSTALLATION METHODS

- A. Floors, except at Shower:

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## Tile Section 09 3000

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1. Thin-set in accordance with ANSI A108.5 using TCNA Method F113A.
- B. Walls, except at Shower:
1. Thin-set over Cement Backer Board at stud walls: Install over cement backer board in accordance with ANSI A108.5 using TCNA Method W244C.
- C. Shower Receptors and Walls:
1. Walls at wood studs: Mortar-set over waterproofing membrane, in accordance with ANSI A108.1 using TCNA Method W231. Waterproofing membrane is specified in Section 07 1353.
  2. Floors: Mortar-set over waterproofing membrane, in accordance with ANSI A108.1 using TCNA Method F111 with waterproofing membrane. Waterproofing membrane is specified in Section 07 1353.
  3. Refer to Finish Legend and details for additional information.
- D. Expansion Joints: Comply with TCNA Method EJ171. Proposed joint locations shall be approved by the Architect.
1. Interior: Provide expansion joints over cold joints and saw-cut control joints, and where tile abuts restraining surfaces. Joint width for ceramic tile and glazed wall tile shall be minimum 1/8-inch.
  2. Sealant Materials: As specified in Section 07 9200.

### 3.5 CLEANING

- A. Upon completion of placement and grouting, clean tile surfaces so they are free of foreign matter.
1. Remove latex-portland cement grout residue from tile as soon as possible.
  2. Do not use acid or acid cleaners to clean tile.
- B. Leave finished installation clean and free of cracked, chipped, broken, unbonded, and otherwise defective tile work.

### 3.6 CURING

- A. Damp cure tile installations, including portland cement grouts, for a minimum of 72-hours.
1. Cover with clean non-staining kraft paper.
  2. Do not use polyethylene sheets directly over tile on horizontal surfaces.

### 3.7 PROTECTION

- A. Provide final protection and maintain conditions in a manner acceptable to manufacturer and installer that ensures tile is without damage or deterioration at time of Substantial Completion.
1. When recommended by tile manufacturer, apply a protective coat of neutral protective cleaner to completed tile walls and floors. Protect installed tile work with kraft paper or other heavy covering during construction period to prevent staining, damage, and wear.
  2. Prohibit foot and wheel traffic from tiled floors for at least 7-days after grouting is completed.
- B. Before final inspection, remove protective coverings and rinse neutral cleaner from tile surfaces.

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Tile Section 09 3000

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- C. Apply sealer to portland cement grout installations in accordance with sealer manufacturer's recommendations. Apply to small test area and obtain Architect's approval before proceeding with application over large areas.

**END OF SECTION 09 3000**



# EXHIBIT C

Acoustical Ceilings Section 09 5100

## ACOUSTICAL CEILINGS SECTION 09 5100

### PART 1-GENERAL

#### 1.1 SUMMARY

A. Description: Provide Acoustical Ceilings, as shown and specified per Contract documents.

#### 1.2 SUBMITTALS

A. General: Refer to GENERAL CONDITIONS.

B. Shop Drawings: Submit shop drawings showing suspension system details and reflected ceiling plans indicating location of light fixtures, mechanical air supply and return outlets and other items affecting ceiling construction. Identify locations of types of suspension systems and types of panels or tile including access panels, where required.

C. Samples:

1. Acoustical Board

2. Suspension System

D. Product Data: Submit manufacturer's specifications, data, and installation instructions for review.

E. Certificates: Manufacturer's certified test reports for each specified NRC and STC requirement.

F. Closeout:

1. General: Refer to GENERAL CONDITIONS.

2. Maintenance Data: Manufacturer's instructions.

3. Extra Stock: Deliver one (1) percent or a minimum of one full container of each kind and type of acoustical material by Owner.

4. Guarantee: Provide in required form for a period of two (2) years from date of final acceptance by Owner.

#### 1.3 QUALITY REQUIREMENTS

A. General: Refer to GENERAL CONDITIONS.

B. Reference Standards:

1. General: Refer to GENERAL CONDITIONS for reference standards, applicable codes and definitions. Provide completely designed system complying with requirements of CBC.

2. American Society of Testing Materials (ASTM): Materials and testing standards as identified throughout this Section.

3. Ceilings and Interior Systems Construction Association (CISCA): Acoustical Ceilings, Use and Practice.

# EXHIBIT C

## Acoustical Ceilings Section 09 5100

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4. Underwriters Laboratory (UL): Fire Resistance Directory and Building Material Directory.
  5. Uniform Building Code (UBC): Standard 8-1.
  6. ASTM A641 for ceiling suspension materials.
  7. ASTM E84 for acoustic panels.
- C. Qualifications: Installer specializing in the work of this Section with minimum three (3) years documented experience.

## PART 2- PRODUCTS

### 2.1 MATERIALS

- A. General: Refer to GENERAL CONDITIONS
- B. Manufacturer:
  1. General: Specified products are manufactured by Armstrong World Industries, Inc.
  2. Alternate Manufacturers: Comparable products manufactured by USG Interiors, Inc., or accepted equal.
- C. Acoustical Tile: CALLA High CAC Square Lay-in Square Tegular ceiling tile, 24" x 24" x 1", CAC 40, Class A (ASTM E84); flame spread 25.
- D. Suspension System: Suprafine 9/16", white, including manufacturer's heavy duty exposed runners, cross-runners and accessories, with exposed cross-runners coped to lay flush with main runners. Provide uniform factory applied finish on exposed surfaces of ceiling suspension system including moldings, trim and accessories, to match exposed runners.
- E. Miscellaneous Materials:
  1. Hanger wires: Galvanized carbon steel full length, ASTM A641 .soft temper, pre-stretched, yield-stress load of at least three times design load, but not less than 12 gauge.

## PART 3- EXECUTION

### 3.1 PERFORMANCE

- A. General: Refer to GENERAL CONDITIONS

### 3.2 PREPARATION

- A. Environmental Requirements: Maintain temperature approximating operational conditions, before, during and after installation; humidity not more than 70%.
- B. Examination: Examine conditions of work in place before beginning work; report defects.

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## Acoustical Ceilings Section 09 5100

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- C. Surface Preparation: Comply with ASTM C636 Article 3, Interference of Ceiling Related Components; coordinate requirements with other trades. Verify that required work has been installed above ceiling and that perimeter wall work, where ceiling abuts, is completed and dry.

### 3.3 INSTALLATION

- A. General: Install in conformance with referenced standards, manufacturer's written directions, as shown, and as specified.
- B. Acoustical Tile:
  - 1. Tile: Install smooth, level and plumb, as shown; with exposed tile joints true and straight, and junctures neat, tight and properly trimmed. Unevenness edge or corner offsets, cupping, scratches, broken tile or other imperfections, not acceptable.
  - 2. Adhesive: Place 1-1/4 inch diameter, minimum, spots of adhesive at corners. Press and slide tile into place with face surface aligned and level.

### 3.4 CLEANING

- A. General: Upon completion, thoroughly clean surfaces per manufacturer's instructions.

END OF SECTION 09 5100

# EXHIBIT C

Resilient Base Section 09 6500

## RESILIENT BASE SECTION 09 6500

### PART 1 - GENERAL

#### 1.1 SUMMARY

- A. Description: Provide resilient base, as shown and specified per contract documents.

#### 1.2 SUBMITTALS

- A. Product data for each type of product specified.
  - 1. Certification by manufacturer that products supplied for installation comply with local regulations controlling use of volatile organic compounds (VOC's).
- B. Samples for selection purposes in form of manufacturer's actual samples showing full range of colors and patterns available for each type of resilient base product indicated.
- C. Product certificates signed by manufacturer certifying that each product complies with requirements.
- D. Maintenance data for resilient base, to include in Operating and Maintenance Manual specified in GENERAL CONDITIONS.

#### 1.3 QUALITY ASSURANCE

- A. General: Refer to GENERAL CONDITIONS
- B. Single-Source Responsibility: Obtain each type, color, and pattern of base from a single source with resources to provide products of consistent quality in appearance and physical properties without delaying progress of the Work.
- C. Fire Performance Characteristics: Provide resilient base with the following fire performance characteristics as determined by testing products per ASTM test method indicated below by UL or another testing and inspecting agency acceptable to authorities having jurisdiction.
  - 1. Critical Radiant Flux: 0.45 watts per sq. cm or more per ASTM E 648.
  - 2. Smoke Density: Less than 450 per ASTM E 662.

#### 1.4 DELIVERY, STORAGE, AND HANDLING

- A. Deliver base and installation accessories to Project site in original manufacturers unopened cartons and containers each bearing names of product and manufacturer, Project identification, and shipping and handling instructions.
- B. Store base materials in dry spaces protected from the weather with ambient temperatures maintained

# EXHIBIT C

## Resilient Base Section 09 6500

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between 50 deg F (10 deg C) and 90 deg F (32 deg C).

- C. Store base on flat surfaces. Move base and installation accessories into spaces where they will be installed at least 48 hours in advance of installation.

### 1.5 PROJECT CONDITIONS

- A. Maintain a minimum temperature of 70 deg F (21 deg C) in spaces to receive base for at least 48 hours prior to installation, during installation, and for not less than 48 hours after installation. After this period, maintain a temperature of not less than 55 deg F (13 deg C).
- B. Do not install base until they are at the same temperature as the space where they are to be installed.

### 1.6 SEQUENCING AND SCHEDULING

- A. Install base and accessories after other finishing operations, including painting, have been completed.
- B. Do not install base over concrete slabs until the slabs have cured and are sufficiently dry to bond with adhesive as determined by manufacturer's recommended bond and moisture test.

### 1.7 EXTRA MATERIALS

- A. Deliver extra materials to Owner. Furnish extra materials matching products installed as described below, packaged with protective covering for storage and identified with labels clearly describing contents.
  - 1. Furnish extra stock, of each class, wearing surface, color, pattern and size of resilient base installed.

## PART 2 - PRODUCTS

### 2.1 RUBBER BASE

- A. Rubber Base: Provide 6" high rubber base at locations indicated on the Drawings. Manufactures acceptable are Roppe, Burkemercer, FLEXCO Co. or accepted equal.
  - 1. Color shall be as selected by the architect from the manufacture's standard colors, sizes as shown.
  - 2. Provide manufacture's pre-molded outside and inside corner pieces. Bending the rubber base around corners will not be accepted.

### 2.2 INSTALLATION ACCESSORIES

- C. Adhesives (Cements): Water-resistant type recommended by manufacturer to suit resilient base products and substrate conditions indicated.
- D. Transition Moldings: Roppe, Burkemercer or approved equal; provide reducer transition molding at flooring-transitions in maximum available lengths to minimize running joints; provide maximum 1/2" high transition to comply with accessibility requirements of the California Building Code. Color to be selected by the Architect from the manufacture's standard color selection.

# EXHIBIT C

## Resilient Base Section 09 6500

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### PART 3 - EXECUTION

#### 3.1 EXAMINATION

- A. General: Examine areas where installation of base will occur, with Installer present, to verify that substrates and conditions are satisfactory for base installation and comply with manufacturer's requirements and those specified in this Section.
- B. Do not proceed with installation until unsatisfactory conditions have been corrected.

#### 3.2 PREPARATION

- A. General: Comply with manufacturer's installation specifications to prepare substrates indicated to receive base.
- B. Remove coatings, including curing compounds, and other substances that are incompatible with base adhesives and that contain soap, wax, oil, or silicone.
- C. Broom or vacuum clean substrates immediately before installation. Following cleaning, examine substrates for moisture, alkaline salts, carbonation, or dust.

#### 3.3 BASE INSTALLATION

- A. General: Comply with base manufacturer's installation directions and other requirements indicated that are applicable to each type of base installation.
- B. Lay out base from center marks established with principal walls, discounting minor offsets, to minimize seams. Adjust as necessary to avoid using cut widths at perimeter that equal less than one-half of a roll width.
- C. Scribe, cut, and fit base to butt tightly to surfaces, permanent fixtures, and built-in furniture including cabinets, pipes, outlets, edgings, and thresholds.
- D. Extend base into toe spaces, door reveals, and similar openings.
- E. Adhere base to substrates without producing open cracks, voids, raising and puckering at joints, telegraphing of adhesive spreader marks, or other surface imperfections in completed base installation.
- F. Use full spread of adhesive applied to substrate in compliance with base manufacturer's.

#### 3.4 CLEANING AND PROTECTION

- A. Perform the following operations immediately after completing base installation:
  - 1. Remove visible adhesive and other surface blemishes using cleaner recommended by base manufacturers.
  - 2. Clean thoroughly.

**END OF SECTION 09 6500**

# EXHIBIT C

Carpeting Section 09 6813

## TILE CARPETING SECTION 09 6813

### PART 1-GENERAL

#### 1.1 SUMMARY

A. Description: Provide Carpeting, as shown and specified per Contract documents.

#### 1.2 SUBMITTALS

A. General: Refer to GENERAL CONDITIONS.

B. Shop Drawings: Show layout of each area to be covered, with location of seams and installation details.

C. Samples:

1. Colors: Submit sample to demonstrate match to existing carpet tile

2. Carpet: 24 inches x 24 inches

D. Product Data: Submit manufacturer's product

E. Closeout:

1. General: Refer to GENERAL CONDITIONS.

2. Maintenance Data: Manufacturer's instructions.

3. Extra Stock: Deliver one (1) percent of each kind and type of carpet installed, in shape and size acceptance to the Architect, wrapped in kraft paper.

4. Guarantee: Provide in required form for a period of one (1) year from date of final acceptance by Owner.

#### 1.3 QUALITY REQUIREMENTS

A. General: Refer to GENERAL CONDITIONS.

B. Reference Standards:

1. General: Refer to GENERAL CONDITIONS for reference standards, applicable codes and definitions.

2. American Association of Textile Chemists and Colorists (AATCC):

a. AATCC 16: Colorfastness to Light.

b. AATCC 134: Electrostatic Propensity of Carpets.

c. AATCC 165: Colorfastness to Crocking: Carpets – AATCC Crockmeter Method.

3. American Society of Testing Materials (ASTM): Materials and testing standards as identified throughout this Section.

# EXHIBIT C

## Carpeting Section 09 6813

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4. Carpet and Rug Institute (CRI): CRI 104 – Installation of Commercial Textile Floorcovering Materials.
  5. Germany Institute for Standardization (GIS): DIN 54 318 – Determination of Dimensional Changes of Textile Floor Coverings By Changing Influences of Water and Heat.
  6. U.S. Department of Housing and Urban Development (HUD): Certified Products Directory.
  7. Green Label Program and Testing Procedure.
  8. Green Label Plus Program and Testing Procedure.
- C. Qualifications: Installer specializing in the work of this Section with minimum three (3) years documented experience.

## PART 2- PRODUCTS

### 2.1 MATERIALS

#### A. General: Refer to GENERAL CONDITIONS

1. Carpet shall comply with Green Label Plus Program and Testing Procedures
2. Carpet adhesive shall comply with Green Label Program and Testing Procedures.
3. Adhesives and primers shall meet the requirements from the South Coast Air Quality District Rule 1168.
4. Aerosol adhesives shall meet the requirements of Green Seal Standard GS 36.
5. Provide floor adhesives for a quick release of carpet tile and reapplication per the requirements of the manufacturer.
6. Carpeting shall be a carpet tile system.

#### B. Carpeting:

1. General: Products by Mowhawk Group.
2. Style Name: Artist II, 24 x 24, confirm match to existing
3. Style Number: BT380, confirm match to existing
4. Construction: Tufted, Patterned Loop
5. Fiber: Duracolor Tricolor Premium Nylon
6. Grounding: Integrally constructed for dispersion of static electricity to below level of human sensitivity (2500-3000 volts) per CRI Test for Determining Static Propensity of Carpets. Surface applied grounding not acceptable.
7. Soil and Stain Release Technology: Permanent, built into fiber
8. Color: Composer, #859

#### C. Filler: White premix latex as recommended by manufacturer.



# EXHIBIT C

Carpeting Section 09 6813

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D. Edging Strips:

1. General: See related sections 09 3000 Tile, section 09 6500 Resilient Flooring and Base, and to drawings for transition edge strips.

E. Primer and Adhesive:

1. General: As recommended by manufacturer for this type of installation.
2. Seam Cement: As recommended by manufacturer.

## PART 3- EXECUTION

### 3.1 PERFORMANCE

- A. General: Refer to GENERAL CONDITIONS

### 3.2 PREPARATION

- A. Scheduling: Do not install until building is completely closed and wet operations have been completed.
- B. Environmental Requirements: Maintain minimum temperature of 60 degrees.
- C. Examination: Examine conditions of work in place before beginning work; report defects.
- D. Measurements: Take field measurements; report variance between plan and field dimensions.
- E. Delivery: Deliver carpet to job site with manufacturer's register number tags attached and intact. Submit tags and an accompanying sample cut from each bale to Architect.
- F. Protection: Protect adjacent surfaces from damage.
- G. Surface Preparation: Per CRI; confirm that floor areas to receive carpet are smooth, broom clean and dry prior to beginning installation.
- H. Finishes of subfloors shall comply with tolerances specified by manufacturer for moisture content prior to installing flooring. Provide documentation of moisture content of substrate.

### 3.3 INSTALLATION

- A. General: Install in conformance with referenced standards, manufacturer's written directions, as shown, and as specified.
- B. Layout: Wall to wall in Vertical Ashlar Layout
- C. Application: Secure carpet to floor with adhesive.
- D. Edges: True cut edges and treat to form invisible, non-raveling joints where exposed.
- E. Edge Strips: Provide at transitions of dissimilar floor covering materials.

### 3.4 CLEANING

- A. General: Keep premises free of accumulated waste and rubbish. Upon completion, thoroughly clean and vacuum exposed surfaces per manufacturer's instructions.

# EXHIBIT C

Carpeting Section 09 6813

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END OF SECTION 09 6813

# EXHIBIT C

Sound Absorbing Wall Panels Section 09 8433

## SOUND ABSORBING WALL PANELS SECTION 09 8433

### PART 1-GENERAL

#### 1.1 SUMMARY

- A. Description: Provide Sound Absorbing Wall Panels, as shown and specified per Contract documents.

#### 1.2 SUBMITTALS

- A. General: Refer to GENERAL CONDITIONS.
- B. Product Data: Submit manufacturer's documentation for each product shown, including dimensions, materials, and colors
- C. Samples: Provide samples for each product specified
- D. Product Data: Submit manufacturer's specifications, data including dimensions, materials, and colors and installation instructions for review.
- E. Certificates: Manufacturer's certified test reports for each specified NRC and STC requirement.
- F. Closeout:
  - 1. General: Refer to GENERAL CONDITIONS.
  - 2. Maintenance Data: Manufacturer's instructions.
  - 3. Extra Stock: Deliver one (1) percent or a minimum of one full container of each kind and type of acoustical material by Owner.
  - 4. Guarantee: Provide in required form for a period of two (2) years from date of final acceptance by Owner.

#### 1.3 QUALITY REQUIREMENTS

- A. General: Refer to GENERAL CONDITIONS.
- B. Reference Standards:
  - 1. ASTM C 423 Sound Absorption and Sound Absorption Coefficients by the Reverberation Room Method.
  - 2. ASTM E 84/CAN/ULC S102 Standard Test Method for Surface Burning Characteristics of Building Materials.
  - 3. NFPA 701 (2010; Small Scale Test) Standard Methods of Fire Tests for Flame Resistant Textiles and Films.
  - 4. NFPA 705 Recommended Practice for a Field Flame Test for Textiles and Films.
  - 5. SIN 722-06 Flammability Requirements for Fire Retardant Trees and Plants.

# EXHIBIT C

## Sound Absorbing Wall Panels Section 09 8433

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6. Title 19 California State Fire Marshal minimum requirements for flame resistance products identified in Section 13115, California Health and Safety Code.
7. NF X 70-100 (1986, Tube Furnace Method) Fire Test for Analysis of Pyrolysis and Combustion Gasses. Evaluation of Toxic Fumes.

C. Qualifications: Installer specializing in the work of this Section with minimum three (3) years documented experience.

### 1.4. QUALITY ASSURANCE

A. Single-Source Responsibility: Provide acoustical components and installation components by a single manufacturer.

B. Coordination of Work: Coordinate acoustical component work with installers of related work including, but not limited to light fixtures, mechanical systems, electrical systems, and sprinklers.

### 1.5. DELIVERY, STORAGE, AND HANDLING

A. Deliver acoustical components to project site in original, unopened packages and store them in a fully enclosed space where they will be protected against damage from moisture, direct sunlight, surface contamination, and other causes.

B. Before installing, allow acoustic components to gradually reach room temperature and a stabilized moisture content.

C. Handle acoustic components carefully to avoid damage.

## PART 2- PRODUCTS

### 2.1 MATERIALS

A. General: Refer to GENERAL CONDITIONS

B. Manufacturer:

1. General: Specified products are manufactured by Kirei by Carnegie, 8330 Arjons Dr, San Diego, CA (619)236-9924

C. Acoustic Panels

1. Diamond Acoustic Tiles: Kirei Damond Tiles, ASTM E84 Class A Fire Rating, clusters as shown, color as selected by Architect
2. Rectangular Panels: Kirei Echopanel Acoustic PET Panels, ASTM E84 Class A Fire Rating, 24mm thick, NRC 0.90, length and width sizes as shown, cut to fit, color as selected by Architect

D. Miscellaneous Materials:

1. Adhesives as recommended by manufacturer
2. Trims as shown

# EXHIBIT C

Sound Absorbing Wall Panels Section 09 8433

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## PART 3- EXECUTION

### 3.1 PERFORMANCE

A. General: Refer to GENERAL CONDITIONS

### 3.2 PREPARATION

A. Environmental Requirements: Maintain temperature approximating operational conditions, before, during and after installation; humidity not more than 70%.

B. Examination: Examine conditions of work in place before beginning work; report defects.

### 3.3 INSTALLATION

A. General: Install in conformance with referenced standards, manufacturer's written directions, as shown, and as specified.

B. Workmanship:

1. Diamond tiles shall be installed in clusters as shown, with no cuts or partial diamonds
2. Cuts on rectangular panels shall be clean and sharp, with no frayed or jagged edges.
3. Mount all panels level.
4. Provide tightly butted joints to adjacent panels and surfaces
5. Align panels with existing architectural elements as shown.

D. Trims: File or sand to ease edges so that no sharp edges occur below 7 feet above the floor.

### 3.4 CLEANING

A. General: Upon completion, thoroughly clean surfaces per manufacturer's instructions.

**END OF SECTION 09 8433**

# EXHIBIT C

Painting Section 09 9100

## PAINTING SECTION 09 9100

### PART 1 - GENERAL

#### 1.1 GENERAL

- A. The requirements of the General Conditions, Special Conditions, and Division 1 apply to the work of this Section.

#### 1.2 DESCRIPTION

- A. This Section describes the requirements for painting and finishing of interior and exterior exposed items and surfaces.
1. Surface preparation, priming and coats of paint specified are in addition to shop-priming and surface treatments specified in other Sections.
  2. Work includes painting exposed pipes and ducts, hangers, exposed steel and iron, and primed metal surfaces of Mechanical and Electrical equipment, and general sheet metal work, except as otherwise indicated or specified.
  3. Work includes painting hardware specified as primed (USP or 600).
  4. Work includes sanding shop-primed surfaces and applying specified primer and finish coats.
  5. "Paint" means coating systems materials, including primers, emulsions, enamels, stains, sealers and fillers, and other applied materials whether used as prime, intermediate or finish coats.
- B. Surfaces Not to Be Painted:
1. Pre-finished items, including but not limited to acoustic materials, casework, and finished mechanical and electrical equipment, including light fixtures, switchgear and distribution cabinets.
  2. Concealed surfaces such as walls or ceilings in concealed areas and inaccessible areas, furred areas, pipe spaces, and duct shafts.
  3. Finished metal surfaces such as anodized aluminum, stainless steel, chromium plate, copper, bronze and similar finished materials, exterior aluminum entrances, storefronts, and windows.
  5. Prefinished metal wall panels.
  6. Moving parts of operating units, mechanical and electrical parts, such as valve and damper operators, linkages, sensing devices, motor and fan shafts.
- C. Following categories of work are included under other Sections:
1. Shop priming ferrous metal items including structural steel, metal fabrications, hollow metal work and similar items. The work of this Section includes sanding and applying specified primer on all shop-primed surfaces exposed to view in the completed work.
  2. Shop priming of fabricated components such as architectural woodwork, wood casework and shop-fabricated or factory-built mechanical and electrical equipment or accessories.
  3. Piping identification is specified in Division 22.

# EXHIBIT C

## Painting Section 09 9100

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- D. Do not paint over code-required labels, equipment identification, performance rating, name, or nomenclature plates.

### 1.3 SUBMITTALS

- A. Certification: Furnish certification by the paint manufacturer that products supplied comply with local regulations controlling the use of volatile organic compounds (VOCs).
- B. Samples: Furnish samples of each color and material to be applied, with texture to simulate actual conditions, on representative samples of the actual substrate.
  - 1. Use representative colors when preparing samples for review. Resubmit until required sheen, color, and texture is achieved.
  - 2. Furnish samples on the following substrates for review of color and texture only:
    - a. Painted Wood: Two 12-inch square samples of each color and material on hardboard.
    - b. Stained or Natural Wood: Two 4-inch x 8-inch samples of natural and stained wood finish on actual wood samples.
- C. Product Data: Specified paint systems are those of Benjamin Moore, Dunn Edwards, Frazee, Kelly Moore, Sherwin Williams and Vista. If other paint manufacturers are proposed and accepted by the Architect, furnish product comparison charts showing that proposed paint systems are equal to the specified materials in number of coats, type of paint, and sheen.

### 1.4 QUALITY ASSURANCE

- A. Applicators Qualifications: Engage an experienced applicator who has completed painting system applications similar in material and extent.
- B. Single Source Responsibility: Provide primers and other undercoat paint produced by same manufacturer as finish coats. Use thinners approved by paint manufacturer, and use within recommended limits.
- C. Coordination of Work: Review other Sections in which prime paints are to be provided to ensure compatibility of coatings system for various substrates. Upon request, furnish information or characteristics of finish materials to be used.
- D. Requirements of Regulatory Agencies: Comply with applicable rules and regulations of governing agencies for air quality control.
  - 1. Comply with current applicable regulations of the local air quality district, California Air Resources Board (CARB) and the Environmental Protection Agency (EPA).
  - 2. Regulatory changes may affect the formulation, availability, or use of specified coatings. Confirm availability of coatings to be used prior to start of painting.
- E. Field Samples: On interior wall surfaces provide full-coat finish samples on at least 100-sq. ft. of surface, as directed, until required sheen, color and texture is obtained; simulate finished lighting conditions for review of in-place work. Approved samples will be used as a standard for the Project.

### 1.5 PRODUCT DELIVERY, STORAGE, AND HANDLING

- A. Deliver materials to job site in original, new and unopened packages and containers bearing manufacturer's name, batch number, color, and directions.
- B. Store materials in tightly covered containers. Maintain containers in a clean condition, free of foreign materials and residue.

# EXHIBIT C

## Painting Section 09 9100

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- C. Keep storage area neat and orderly. Remove oily rags and waste daily. Ensure that workers and work areas are adequately protected from fire hazards and health hazards resulting from handling, mixing and application of paints.

### 1.6 JOB CONDITIONS

- A. Apply water-base paints when temperature of surfaces to be painted and surrounding air temperatures are between 50-deg. F. and 90-deg. F., unless otherwise permitted by paint manufacturer's printed instructions.
- B. Apply solvent-thinned paints only when temperature of surfaces to be painted and surrounding air temperatures are between 45-deg. F. and 90-deg. F., unless otherwise permitted by paint manufacturer's printed instructions.
- C. Do not apply paint in rain, fog or mist, when relative humidity exceeds 85-percent, or when temperature is less than 5-deg. F. above dew point, or to damp or wet surfaces, unless otherwise permitted by paint manufacturer's printed instructions.
- D. Provide adequate ventilation during interior painting using as close to 100-percent outside air as possible.

### 1.7 EXTRA MATERIALS

- A. In addition to materials for completion of the work, furnish 5-gallons of additional materials for each type and color of opaque paint used.
- B. Furnish extra materials from same production lots or color runs used in the work. Furnish in containers factory sealed and labeled. Identify each container with Project name and type of material.
- C. Deliver materials and an inventory list just prior to Substantial Completion and store where directed by Owner.

## PART 2 - PRODUCTS

### 2.1 APPROVED MANUFACTURERS

- A. Benjamin Moore, Dunn Edwards, Frazee, Kelly Moore, Sherwin Williams, Vista or approved equal.

### 2.2 MATERIALS

- A. Material Compatibility: Provide block fillers, primers, finish coat materials, and related materials that are compatible with one another and the substrates indicated under conditions of service and application.
- B. Material Quality: Provide best quality grade of coatings as regularly manufactured by acceptable paint materials manufacturers. Materials not displaying manufacturer's identification as a standard, best-grade product will not be acceptable. Each product within any one paint system shall be from the same manufacturer.

### 2.3 COLORS

- A. Colors of paints, including shades of stain, shall match color samples approved by Architect.

## PART 3 - EXECUTION

### 3.1 EXAMINATION



# EXHIBIT C

## Painting Section 09 9100

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- A. Examine substrates and conditions under which painting is to be applied. Surfaces receiving paint shall be thoroughly dry before paint is applied.
  - 1. Provide barrier coats over incompatible primers or remove and re-prime as required. Notify Architect prior to applying barrier coats.
  - 2. Clean surfaces before applying paint or surface treatments. Remove oil and grease prior to mechanical cleaning.
  - 3. Start of painting will be construed as the applicator's acceptance of surfaces and conditions within a particular area.

### 3.2 PROTECTION

- A. Protection: Protect work of other Sections against damage by painting and finishing work. Correct damage by cleaning, repairing or replacing, and repainting, as acceptable to Architect.
  - 1. Provide "Wet Paint" signs as required to protect newly painted finishes. Remove temporary protective wrappings provided by others for protection of their work, after completion of painting operations.
  - 2. Remove or protect hardware, hardware accessories, machined surfaces, plates, lighting fixtures, and similar items in place and not to be finish-painted, or provide surface-applied protection prior to surface preparation and painting. Following completion of painting, reinstall removed items.
  - 3. At completion of work of other Sections, touch-up and restore damaged or defaced painted surfaces.

### 3.3 SURFACE PREPARATION

- A. Concrete and Masonry:
  - 1. Prepare surfaces to be painted by removing surface contaminates.
    - a. Remove efflorescence with stiff bristle brush, wire brushing, wiping, sandblasting or acid washing and rinsing. Allow to dry.
    - b. Remove chalk, dust, dirt, asphalt, tar or excessive mortar by scraping or wire brushing.
    - c. Remove rust, grease or oil by solvent cleaning or sandblasting.
    - d. Treat concrete surfaces which are highly glazed or where traces of form release agents are present with a preparation of one-part concentrated muriatic acid, 4-parts water and one-part detergent or as recommended by parting compound manufacturer. Remove acid with water. Allow to dry.
    - e. Remove stains on concrete resulting from weathering or corroded metals, with a solution of 2-oz. sodium methasilicate in one-gallon water. Wet stained areas with water before application of solution. Allow to dry.
- B. Plaster:
  - 1. Clean surfaces free from grit, loose plaster and surface irregularities.
  - 2. Determine alkalinity and moisture content by performing appropriate tests. Do not paint over surfaces where moisture content exceeds that permitted in manufacturer's literature or where pH exceeds 10.

# EXHIBIT C

## Painting Section 09 9100

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- C. Wood: Clean surfaces of dirt, oil, and other foreign substances with scrapers, mineral spirits, and sandpaper, as required. Sand surfaces exposed to view smooth and dust off.
  - 1. Scrape and clean small, dry, seasoned knots, and apply a thin coat of white shellac or other recommended knot sealer before applying primer. After priming, fill holes and imperfections in finish surfaces with putty or plastic wood filler. Sand smooth when dry.
  - 2. Prime, stain, or seal wood to be painted immediately upon delivery. Prime edges, ends, faces, undersides, and backsides of wood, including cabinets, counters, cases, and paneling.
  - 3. When transparent finish is required, back-prime with spar varnish.
  - 4. Back-prime paneling on interior partitions where masonry, plaster, or other wet wall construction occurs on backside.
  - 5. Seal tops, bottoms, and cutouts of unprimed wood doors with a heavy coat of varnish or sealer immediately upon delivery.
- D. Ferrous Metal: Clean ungalvanized ferrous metal surfaces that have not been shop-coated; remove oil, grease, dirt, loose mill scale, and other foreign substances. Use solvent or mechanical cleaning methods that comply with recommendations of The Society for Protective Coatings (SSPC).
  - 1. Blast surfaces clean as recommended by the paint system manufacturer and according to requirements of SSPC specification SSPC-SP 10.
  - 2. Treat bare and sandblasted or pickled clean metal with a metal treatment wash coat before priming.
  - 3. Sand shop-applied prime coats to a smooth surface, ready to receive specified primer and finish coats.
- E. Galvanized Metals: Clean with non-petroleum-based solvents so that the surface is free of oil and surface contaminants. Remove pretreatment from galvanized sheet metal fabricated from coil stock by mechanical methods.
- F. Gypsum Board: Clean surfaces of dust, dirt, grease, oil and other foreign matter and dust clean.

### 3.4 MATERIALS PREPARATION

- A. Mix and prepare painting materials in accordance with manufacturer's directions.
- B. Maintain containers used in mixing and application of paint in a clean condition, free of foreign materials and residue.
- C. Stir materials before application to produce a mixture of uniform density, and stir as required during application. Do not stir surface film into material. Remove film and strain material before using.
- D. Use thinners approved by paint manufacturer and only within recommended limits.
- E. Tinting: Tint each undercoat a lighter shade to facilitate identification of each coat where multiple coats of the same material are applied. Tint undercoats to match the color of the finish coat, but provide sufficient differences in shade of undercoats to distinguish each separate coat.

### 3.5 APPLICATION

- A. General: Apply paint in accordance with manufacturer's directions. Use applicators and techniques best suited for substrate and type of material being applied.
  - 1. Provide finish coats compatible with prime coats.

# EXHIBIT C

## Painting Section 09 9100

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2. The number of coats required is the same regardless of the application method. Do not apply following coats until the previous coat has cured as recommended by the manufacturer. Sand between applications where required to produce a smooth even surface.
  3. Apply additional coats when undercoats, stains or other conditions show through final coat, until paint film is of uniform finish, color and appearance. Edges, corners, crevices, welds, and exposed fasteners shall receive a dry film thickness equivalent to that of flat surfaces.
  4. Paint surfaces behind movable equipment and furniture.
  5. Paint surfaces behind permanently-fixed equipment or furniture with prime coat before final installation of equipment.
  6. Paint visible surfaces of ducts where visible through registers or grilles with a flat, non-specular black paint.
  7. Paint back sides of access panels, and removable or hinged covers to match exposed surfaces.
  8. Finish doors on top, bottom and side edges same as faces. Where openings into rooms have different finishes, finish door edges as directed by the Architect.
  9. Omit primer on metal surfaces that have been shop-primed and touch-up painted, unless otherwise indicated.
- B. Scheduling Painting: Apply first-coat material to surfaces that have been cleaned, pretreated or otherwise prepared for painting as soon as practicable after preparation.
1. Allow sufficient time between successive coatings to permit proper drying.
- C. Application Procedures: Apply paints and coatings by brush, roller, spray, or other applicators according to manufacturer's instructions.
1. Brushes: Use brushes best suited for the material applied.
  2. Rollers: Use rollers of carpet, velvet back, or high-pile sheep's wool as recommended by the manufacturer for the material and texture required.
  3. Spray Equipment: Use airless spray equipment with orifice size as recommended by the manufacturer for the material and texture required.
- D. Minimum Coating Thickness: Apply materials at not less than manufacturer's recommended spreading rate.
- E. Mechanical and Electrical Work: Painting mechanical and electrical work is limited to items exposed in mechanical equipment rooms and in occupied spaces. Finish to match adjoining wall or ceiling surfaces.
1. Mechanical items to be painted include, but are not limited to, piping, hangers, and supports; heat exchangers; tanks; ductwork; insulation; supports; motors and mechanical equipment; air grilles and diffusers; and accessory items.
  2. Electrical items to be painted include, but are not limited to conduit and fittings, panels, and switchgear.
- F. Block Filler: Apply block fillers to concrete masonry block at a rate to ensure complete coverage with pores completely filled flush, free of pinholes. Provide multiple coats if required.

# EXHIBIT C

## Painting Section 09 9100

- G. Prime Coats: Before applying finish coats, apply a prime coat. Re-coat primed and sealed surfaces where there is evidence of suction spots or unsealed areas to assure a finish coat with no burn-through or other defects.
- H. Pigmented (Opaque) Finishes: Completely cover to provide an opaque, smooth surface of uniform finish, color, appearance and coverage. Cloudiness, spotting, holidays, laps, brush marks, runs, sags, ropiness and other surface imperfections will not be acceptable.
- I. Transparent (Clear) Finishes: Use multiple coats to produce glass-smooth surface film of even luster. Provide a finish free of laps, cloudiness, color irregularity, runs, brush marks, orange peel, nail holes, or other surface imperfections.
- J. Completed Work: Match approved samples for color, texture and coverage. Remove, refinish or repaint work not in compliance with specified requirements.

### 3.6 FIELD QUALITY CONTROL

- A. The Owner reserves the right to invoke the following test procedure at any time and as often as the Owner deems necessary during painting.
  - 1. The Owner will engage the services of an independent testing agency to sample the paint material being used. Samples of material delivered to the Project will be taken, identified, sealed, and certified in the presence of the Contractor.
  - 2. The testing laboratory will perform appropriate tests for material analysis, abrasion resistance, reflectivity, flexibility, washability, absorption, accelerated weathering, dry opacity, accelerated yellowness, re-coating, skinning, color retention, alkali and mildew resistance, and application to specified mil thickness.
  - 3. If test results show material being used does not comply with specified requirements, the Contractor may be directed to stop painting, remove non-complying paint, pay for testing, repaint surfaces coated with rejected material, and remove rejected material from previously painted surfaces if, upon repainting with specified paint, the two coatings are incompatible.

### 3.7 CLEANING

- A. Clean-Up: During progress of work, remove discarded paint materials, rubbish, cans and rags at end of each work day.
- B. Upon completion of painting work, clean window glass and other paint-spattered surfaces. Remove spattered paint by washing and scraping; do not scratch or damage finished surfaces.

### 3.8 EXTERIOR PAINT SCHEDULE

	BENJAMIN MOORE	DUNN-EDWARDS	FRAZEE/COMEX	KELLY-MOORE	SHERWIN WILLIAMS	VISTA	MPI CATEGORY
<b>A. Ferrous Metal, 100% Acrylic Semigloss</b>							
First Coat	Acrylic Metal Primer M04	Bloc-Rust BRPR00	561 Acrylic Metal Primer	1725 Acry-Shield Primer	ProCryl B66-310 Acrylic Primer	9600 Protec Metal Primer	107
Second Coat	Aura Exterior Semi-Gloss #632	EVSH50 Evershield SG	124 Mirro Glide SG	1250 Acry-Shield	A-100 A8 Selmigloss	7500 Acriglo Semi Gloss	11
Third Coat	Aura Exterior Match existing sheen	EVSH50 Evershield Match existing sheen	124 Mirro Glide Match existing sheen	1250 Acry-Shield Match existing sheen	A-100 A8 Match existing sheen	7500 Acriglo Match existing sheen	11
<b>B. Galvanized and Zinc Alloy Metal, 100% Acrylic Semigloss</b>							
Pretreatment	Etch	ME-01 Etch	Jasco Prep N' Prime	Jasco Prep N' Prime	B71Y1 DTM Wash Primer	Jasco Prep N' Prime	

# EXHIBIT C

## Painting Section 09 9100

First Coat	Fresh Start Acrylic Primer #023	Ultragrip Premium UGPR00	561 Acrylic Metal Primer	1725 Acry-Shield Primer	ProCryl B66-310Primer	4800 Metal Pro Primer	134
Second Coat	Aura Exterior Semi-Gloss #632	EVSH50 Evershield SG	124 Mirro Glide SG	1250 Acry-Shield	A-100 A8 Semigloss	7500 Acriglo Semi Gloss	11
Third Coat	Aura Exterior Match existing sheen	EVSH50 Evershield Match existing sheen	124 Mirro Glide Match existing sheen	1250 Acry-Shield Match existing sheen	A-100 A8 Match existing sheen	7500 Acriglo Match existing sheen	11

### 3.9 INTERIOR PAINT SCHEDULE

	BENJAMIN MOORE	DUNN-EDWARDS	FRAZEE/COMEX	KELLY-MOORE	SHERWIN WILLIAMS	VISTA	MPI CATEGORY
<b>A. Wood, 100% Acrylic Low Odor/Zero VOC Semigloss</b>							
First Coat	Eco Spec WB Primer N372	UGSL00 Ultragrip Select	C153 UltraTech	973 Acry-Plex	ProMar 200 Zero B28-200 Primer	5001 V-Pro Primer	46
Second and Third Coats	Eco Spec Latex Semi-Gloss N376	SZR050 Sparta-Zero Semi-Gloss	C175 UltraTech Zero	1520 Enviro-Coat	ProMar 200 Zero B31-2600 Semi-Gloss	5400 V-Pro Semi Gloss	---
<b>B. Wood, Clear Satin Urethane Finish</b>							
First Coat	Benwood Quick Dry Sanding Sealer 413	Defthane Polyurethane Gloss	Varathane Diamond WB Finish	2097 Kel-Thane II	A68V91 Wood Classics WB Polyurethane Varnish GL	107 Acrithane Sanding Sealer	---
Second and Third Coats	Benwood Acrylic Polyurethane Low Lustre 423	Defthane Polyurethane Satin	Varathane Diamond WB Finish	2097 Kel-Thane II	A68 Wood Classics WB Polyurethane Varnish SG	109 Acrithane Semi Gloss	128
<b>C. Wood, Stain and Satin Urethane Finish</b>							
First Coat	Lenmar 1 WB Wiping Stain	Old Masters Wiping Stain	ZAR Wood Stain	1281 Modern Wood Finish	Minwax 250 Oil Stain	Minwax 250 Oil Stain	90
Second Coat	Benwood Quick Dry Sanding Sealer #413	Old Masters Water-Based Sanding Sealer	Varathane Diamond WB Satin	2783 Woodcraft Clear Vinyl Sealer	A68V91 Wood Classics WB Polyurethane Varnish GL	107 Acrithane Sanding Sealer	---
Third and Fourth Coats	Benwood Polyurethane Low Lustre 423	Old Masters Water-Based Polyurethane Satin	Varathane Diamond WB Satin	2097 Kel-Thane II	A68 Wood Classics WB Polyurethane Varnish SG	109 Acrithane Semi Gloss	128
<b>D. Concrete and Plaster, Acrylic Low Odor/Zero VOC Flat</b>							
First Coat	Eco Spec Latex Primer Sealer N372	Ultra-Grip Select UGSL00	C153 UltraTech	973 Acry-Plex	ProMar 200 Zero B28-2600 Primer	5001 V-Pro Primer	50
Second and Third Coats	Eco Spec Latex Flat 373	SZR010 Sparta-Zero Flat	C171 UltraTech Zero	1500 Enviro-Coat	ProMar 200 Zero B30w2600 Flat	5100 V-Pro Flat	143
<b>E. Concrete and Plaster, 100% Acrylic Low Odor/Zero VOC Low Sheen/Eggshell</b>							
First Coat	Eco Spec Latex Primer Sealer N372	Ultra-Grip Select UGSL00	C153 UltraTech	973 Acry-Plex	ProMar 200 Zero B28w2600 Primer	5001 V-Pro Primer	50

# EXHIBIT C

## Painting Section 09 9100

	Second and Third Coats	Eco Spec Latex Eggshell Finish N374	SZRI030 Sparta-Zero Eggshell	C172 UltraTech	1510 Enviro-Coat	ProMar 200 Zero B20w2651 Eggshell	5300 V-Pro Eggshell	145
<b>F. Concrete and Plaster, 100% Acrylic Low Odor/Zero VOC Semigloss</b>								
	First Coat	Eco Spec Latex Primer Sealer N372	SBSL00 Smooth Blocfil Select	C153 UltraTech	973 Acry-Plex	ProMar 200 Zero B28-2600 Primer	5001 V-Pro Primer	50
	Second and Third Coats	Eco Spec Latex Semi-Gloss N376	SZR050 Sparta-Zero Semigloss	C175 UltraTech Zero	1520 Enviro-Coat	HP Acrylic B66w651 Semi-Gloss	5400 V-Pro Semi Gloss	147
<b>G. Concrete Block, Acrylic Low Odor/Zero VOC Flat</b>								
	First Coat	PPG 6-15 Masonry Block Filler	SBSL00 Smooth Blocfil Select	C302 UltraTech Acrylic Block Filler	521 Color Shield	B25W25 PrepRite Block Filler	040 Acrylic Block Filler	4
	Second and Third Coats	Eco Spec Latex Flat 373	SZR010 Sparta-Zero Flat	C171 UltraTech Zero	1500 Enviro-Coat	ProMar 200 Zero B30w2600 Flat	5100 V-Pro Flat	143
<b>H. Concrete Block, 100% Acrylic Low Odor/Zero VOC Semigloss</b>								
	First Coat	PPG 6-15 Masonry Block Filler	SBSL00 Smooth Blocfil Select	C302 UltraTech Block Filler	521 Color Shield	B25W25 PrepRite Block Filler	040 Acrylic Block Filler	4
	Second and Third Coats	Eco Spec Latex Semi-Gloss N376	SZR050 Sparta-Zero Semi-Gloss	C175 UltraTech Zero	1520 Enviro-Coat	HP Acrylic B66w651 Semi-Gloss	5400 V-Pro Semi Gloss	147
<b>I. Concrete Block, Epoxy Semigloss</b>								
	First Coat	PPG 6-15 Masonry Block Filler	Carboline Sanitile 100	C302 UltraTech Block Filler	521 Color Shield	B25W25 PrepRite Block Filler	040 Acrylic Block Filler	4
	Second and Third Coats	PPG 16-510 WB1 Pitt Glaze Acrylic Epoxy	Carboline Sanitile 255 Semi-Gloss	Amercoat 335	7100 Enviro-Poxy	K46 Pro Industrial WB Epoxy	Carboline Carboguard 890 VOC	115
<b>J. Gypsum Board, Acrylic Low Odor/Zero VOC Flat</b>								
	First Coat	Eco Spec Latex Primer Sealer 372	VNSL00 Vinylastic Select	C153 UltraTech	973 Acry-Plex	ProMar 200 Zero B28w2600 Primer	5100 V-Pro Flat	149
	Second and Third Coats	Eco Spec Latex Flat 373	SZR010 Sparta-Zero Flat	C171 UltraTech Zero	1500 Enviro-Coat	ProMar 200 Zero B30w2600 Flat	5100 V-Pro Flat	143
<b>K. Gypsum Board, 100% Acrylic Low Odor/Zero VOC Low Sheen/Eggshell</b>								
	First Coat	Eco Spec Latex Primer Sealer 372	VNSL00 Vinylastic Select	C153 UltraTech	973 Acry-Plex	ProMar 200 Zero B28w2600 Primer	5001 V-Pro Primer	149
	Second and Third Coats	Eco Spec Latex Eggshell Finish 374	SZR030 Sparta-Zero Eggshell	C172 UltraTech Zero	1510 Enviro-Coat	ProMar 200 Zero B28-2651 Eggshell	5300 V-Pro Eggshell	145
<b>L. Gypsum Board, 100% Acrylic Low Odor/Zero VOC Semigloss</b>								
	First Coat	Eco Spec Latex Primer Sealer 372	VNSL00 Vinylastic Select	C153 UltraTech	973 Acry-Plex	ProMar 200 Zero B28w2600 Primer	5001 V-Pro Primer	149
	Second and Third Coats	Eco Spec Latex Semi-Gloss N376	SZR050 Sparta-Zero Semi-Gloss	C175 UltraTech Zero	1520 Enviro-Coat	HP Acrylic B66w651 Semi-Gloss	5400 V-Pro Semi Gloss	147
<b>M. Gypsum Board, Epoxy Semigloss</b>								
	Barrier Coat	Zinnser Gardz	Zinnser Gardz	Zinnser Gardz	Zinnser Gardz	Zinnser Gardz	Zinser Gardz	
	First Coat	Eco Spec Latex Primer	Carboline Sanitile 120	061 Aqua Seal Wall Sealer	971 Acry-Plex	PrepRite 200 Latex Primer	Rustoleum Sierra Epoxy	149

# EXHIBIT C

## Painting Section 09 9100

		Sealer 372					Primer S70	
Second and Third Coats	PPG 16-510 WB1 Pitt Glaze Acrylic Epoxy	Carboline Sanitile 255 Semi-Gloss	Amercoat 335	7100 Enviro-Poxy	K46 Pro Industrial WB Epoxy	Rustoleum Sierra Epoxy S60	115	
<b>N. Ferrous Metal, 100% Acrylic Low Odor/Zero VOC Semigloss</b>								
First Coat	Super Spec Metal Primer P04	ULMS00 Ultrashield Multi-Surface	C309 UltraTech Universal WB Metal Primer	1725 Acry-Shield	ProCryl B66-310 Acrylic Primer	9600 Protec Metal Primer	107	
Second and Third Coats	Eco Spec Latex Semi-Gloss N376	EVER50 Everest Semi-Gloss	C175 UltraTech Zero	1520 Enviro-Coat	HP Acrylic B66w651 Semi-Gloss	5400 V-Pro Semi Gloss	147	
<b>O. Non-Ferrous Metal, 100% Acrylic Low Odor/Zero VOC Semigloss</b>								
Pretreatment	Etch	ME-01 Etch	Jasco Prep N' Prime	Jasco Prep N' Prime	B71Y1 Wash Primer	Jasco Prep N' Prime		
First Coat	Super Spec Metal Primer P04	ULMS00 Ultrashield Multi-Surface	C309 UltraTech Universal WB Metal Primer	1725 Acry-Shield	ProCryl B66-310 Acrylic Primer	Rustoleum Sierra Metalmax S37	107	
Second and Third Coats	Eco Spec Latex Semi-Gloss N376	EVER50 Everest Semi-Gloss	C175 UltraTech Zero	1520 Enviro-Coat	HP Acrylic B66w651 Semi-Gloss	6400 Earth Coat Semi Gloss	147	

END OF SECTION 09 9100

# EXHIBIT C

Stained Concrete Finish Section 09 9300

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## STAINED CONCRETE FINISH SECTION 09 9300

### PART 1 - GENERAL

#### 1.1 SUMMARY

- A. Description: Provide stained concrete finish, as shown and specified per contract documents.

#### 1.2 SUBMITTALS

- A. Product data: Provide chemical stain finish for existing concrete floor slab with color matched curing, sealing, waxing and finishing materials; non slip finish
- B. Samples: submit samples with one surface representative for the required color including stain, color matched curing material, sealer, and materials for non slip finish

#### 1.3 QUALITY ASSURANCE

- A. General: Refer to GENERAL CONDITIONS
- B. Qualifications of Installer: Company with minimum five years successful experience in stained concrete finishes similar to finish required for the project.
- C. Materials: Materials for stained concrete finishes shall each come from a single source.
- D. Coordination: Coordinate manufacturer requirements for preparation of concrete for chemical stain finish.
- E. Mock-up:
  - 1. Provide a four foot by 4 foot in-place mock-up of stained finish
  - 2. Mock-up shall cover both the existing stained floor area and the newly stained floor area, and shall demonstrate how they will match.
  - 3. The newly stained floor area shall be stained to match the existing stained floor area.
- F. If the first mockup is not accepted, contractor is responsible for providing additional mock ups if necessary at his cost until acceptance has been achieved.

### PART 2 - PRODUCTS

#### 2.1 MANUFACTURERS

- A. L.M. Scofield Co, Solomon Colors, Symons Corporation, or approved equal.



# EXHIBIT C

Stained Concrete Finish Section 09 9300

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## 2.2 MATERIALS

- A. System: Match Scofield/Chemstain designed specifically for staining concrete floor slabs.
  - 1. Stain: Chemically reactive, water-solution of metallic salts for coloring cured concrete
  - 2. Color-Matched Curing Material: Manufacturer's standard colored curing material conforming to ASTM C309 Liquid Membrane Forming Compounds for Curing Concrete
  - 3. Sealer and Wax: Manufacturer's standard sealer and wax as recommended for specified system
  - 4. Non-Slip Finish: Floor finish to comply with American with Disabilities Act Accessibility Guidelines (ADAAG) and California Code of Regulations for non slip floor finish
  - 5. Smooth floor finish is required, use of textures is not acceptable
  - 6. Color: Match existing stained concrete floor
  
- B. Grout: Non-metallic, pre-mixed, shrinkage resistant, non-corrosive, non-staining product containing selected silica sands, Portland cement, shrinkage compensating agents, plasticizing and water reducing agents
  - 1. Grout: same base materials, cement, aggregates and pigments, as concrete with coloring as required to match colored concrete
  - 2. Pigments: Pure, non-fading, non-staining, mineral oxides color conforming to ASTM C979 and designed and mixed to provide uniform color finish

## PART 3 - EXECUTION

### 3.1 EXAMINATION

- A. Site Verification of Conditions: Inspect existing substrates and conditions beginning application of color materials to concrete signifies acceptance of substrates and conditions
  - 1. Ensure concrete finishing is done in a manner to allow for application of specified chemical color finish
  - 2. Do not proceed with installation until unsatisfactory conditions have been corrected.

### 3.2 PREPARATION

- A. General: Comply with manufacturer's installation specifications to prepare substrates indicated to receive base.
- B. Remove coatings, including curing compounds, and other substances that are incompatible with staining and finishing products
- C. Lightly grind new and existing concrete surfaces
- D. Clean surfaces as recommended by manufacturer of staining and coating materials

# EXHIBIT C

## Stained Concrete Finish Section 09 9300

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### 3.3 APPLICATION

- A. Apply chemical coloring in curing materials in process conforming to color material manufacture recommendations and instructions as required to match approved samples and mock-up
- B. Touch up non-uniform and weak toned areas as necessary to match approved mockup.
- C. Apply and cure colored concrete surfaces under near identical conditions to minimize appearance blemishes and irregularities beyond those described in manufacturers literature and approved mockup.
- D. Conduct inspections with architect to make repairs or replace unsatisfactory work.
- E. Seal and wax concrete with clear sealer and manufacturer recommended wax after repairs and replaced work is completed

### 3.4 PROTECTION

- A. Exclude traffic for at least 14 days after finishing; when construction traffic is permitted, maintain surfaces as clean by removing stains and materials spillage as they occur

**END OF SECTION 09 9300**

# EXHIBIT C

Signage Section 10 1400

## SIGNAGE SECTION 10 1400

### PART 1-GENERAL

#### 1.1 SUMMARY

A. Description: Provide Signage, as shown and specified per Contract documents.

#### 1.2 SUBMITTALS

A. General: Refer to GENERAL CONDITIONS.

B. Shop drawings: Submit manufacturer's standard colors and letter styles for review.

C. Product Data: Submit manufacturer's specifications, data, and installation instructions for review.

D. Closeout:

1. General: Refer to GENERAL CONDITIONS.

2. Guarantee: Provide in required form for a period of one (1) year from date of final acceptance by Owner.

#### 1.3 QUALITY REQUIREMENTS

A. General: Refer to GENERAL CONDITIONS.

B. Reference Standards:

1. General: Refer to GENERAL CONDITIONS for reference standards, applicable codes and definitions.

2. California Building Code (CBC): Sections 1115B5, 1117B.5.1.1. and 1117B.5.10.

3. Americans with Disabilities Act (ADA): Standards.

### PART 2- PRODUCTS

#### 2.1 MATERIALS

A. General: Refer to GENERAL CONDITIONS

B. Plastic Signs:

1. General:

a. Sign: 1/8 inch thick, unless otherwise noted, engraved laminated plastic, color as selected by Architect; engraving 1/32 inch deep in contrasting background color.

b. Letters 3/4 inch high, minimum; style as selected by Architect.

c. Symbols: International style.

# EXHIBIT C

## Signage Section 10 1400

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- d. Braille: Dots 1/10 inch on center in each cell with 2/10 inch space between cells, raised minimum of 1/40 inch above background; California Contract Grade 2 Braille.
2. Capacity Signs:
    - a. General: Per CBC; Typical 1/8 inch thick; number of occupants to be determined by the Architect for each room, where required.
    - b. Maximum Number – General: “The number of people permitted in this room shall not exceed \_\_\_ by order of the State Fire Marshal.” Number of occupants as shown on the Drawings.
    - c. At Exit Doors: “This Door to Remain Unlocked During Business Hours.”
  3. Toilet Room Door Signs:
    - a. General: Per CBC Section 1115B.5; ¼ inch thick with eased edges, with raised letters and Braille, as shown. Background color to contrast with door color.
    - b. All Gender: A combined circle and triangle symbol shall be located at entrances to unisex toilet and bathing facilities. The combined circle and triangle symbol shall consist of a circle symbol ¼ inch (6.4 mm) thick and 12 inches (305 mm) in diameter with a ¼ inch (6.4 mm) thick equilateral triangle symbol superimposed on and geometrically inscribed within the 12-inch (305 mm) diameter of the circle symbol. The vertices of the triangle symbol shall be located ¼ inch (6.4 mm) maximum from the edge of the circle symbol with a vertex pointing upward. The color of the triangle symbol shall contrast with the color of the circle symbol, either light on a dark background or dark on a light background. The color of the circle symbol shall contrast with the color of the door or surface on which the combined circle and triangle symbol is mounted, either light on a dark background or dark on a light background.
    - d. Side Mounted Signs: Per CBC Section 1115B.5 and 1117B.5.7.
  5. Entrance and Exit Signs:
    - a. General: Per CBC 1117B.5 9 inches high x 6 inches wide, ¼ inch thick, with eased edges.
    - b. Entrance: International symbol of accessibility with the word “ENTRANCE” below symbol.
    - c. Exit International symbol of accessibility with the word “EXIT” below symbol, and directional arrow pointing to required exit, where required.
  6. Other Signage: as indicated on drawings
4. Other Signage: as indicated on drawings
- C. Fasteners: As recommended by manufacturer; tamper-proof screws; anchors where required.
  - D. Adhesives: As recommended by manufacturer.

## PART 3- EXECUTION

### 3.1 PERFORMANCE

- A. General: Refer to GENERAL CONDITIONS

### 3.2 PREPARATION

# EXHIBIT C

## Signage Section 10 1400

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- A. Environmental Requirements: Do not install plastic signs when temperature is below 70 degrees F.
- B. Examination: Examine conditions of surface in place before beginning work; report defects.

### 3.3 INSTALLATION

- A. General: Install in conformance with referenced standards, manufacturer's written directions, as shown, and as specified.
- B. Locations: As shown, or as directed by the Architect.
- C. Surface Mounted:
  - 1. Room Identification: As directed, per CBC 1117B.5.9.
  - 2. Capacity Signs: As directed, per CBC.
  - 3. Toilet Room Signs: As directed, per CBC Section 1115.B.5 and 1117B.5.9.
  - 4. Entrance and Exit signs:
    - a. General: Per CBC Section 117B.5.7.
    - b. Entrance: Provide at each handicapped accessible entrance
    - c. Exit: Provide at handicapped exits

### 3.4 CLEANING

- A. General: Upon completion, thoroughly clean exposed surfaces per manufacturer's instruction.

**END OF SECTION 10 1400**

# EXHIBIT C

Toilet & Shower Accessories Section 10 2800

## TOILET & SHOWER ACCESSORIES SECTION 10 2800

### PART 1-GENERAL

#### 1.1 SUMMARY

A. Description: Provide Toilet and Shower Accessories, as shown and specified per Contract documents.

#### 1.2 SUBMITTALS

A. General: Refer to GENERAL CONDITIONS

B. Product Data: Manufacturer's product data and installation instruction for each product

C. Closeout:

1. General: Refer to GENERAL CONDITIONS

2. Maintenance Data: Manufacturer's instructions.

3. Guarantee: Provide in required form for a period of one (1) year from date of final acceptance by Owner.

#### 1.3 QUALITY REQUIREMENTS

A. General: Refer to GENERAL CONDITIONS

B. Reference Standards:

1. General: Refer to GENERAL CONDITIONS for reference standards, applicable codes and definitions.

2. American National Standards Institute (ANSI): ANSI 117.1 – Safety Standards for the Handicapped.

3. Americans with Disabilities Act (ADA): Standards.

4. International Sanitary Supply Association (ISSA): Standards.

5. California Building Codes (CBC): Section 1115B.8.

### PART 2- PRODUCTS

#### 2.1 MATERIALS

A. General: Refer to GENERAL CONDITIONS

B. Manufacture:

1. General: Products are manufactured by Bobrick Washroom Equipment, Inc., unless otherwise indicated; key lockable accessories alike.

# EXHIBIT C

## Toilet & Shower Accessories Section 10 2800

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2. Alternate Manufacturers: Comparable products manufactured by the Washroom Accessories Division of the Bradley Corp., or accepted equal.
3. Finishes: Type 304 stainless steel; No. 4 satin finish, unless otherwise specified
4. Templates and Backplates: Furnish to applicable trades as required for each accessory together with location and mounting height.

### C. Toilet and Shower Accessories:

1. Shower Curtain Hooks: Bobrick B-204-1; stainless steel shower curtain hooks, quantity as required for shower curtains
2. Shower Curtains: Bobrick vinyl shower curtains B204-3
3. Shower Curtain Rod: Bobrick Classic Series Extra-Heavy-Duty shower curtain rod, B-6047 x length required to fit shower
4. Shower Soap Dispenser: Aviva 36144 Chrome
5. Shower Clothes Hooks: Bobrick stainless steel clothes hooks, B-233, quantity and locations as shown
6. Pedestal Bench: Lenox Locker Pedestal Bench, 18" wide x 24" long, charcoal grey
7. Paper Towel Dispenser and Waste Receptacle: Bobrick Classic Series Recessed Paper Towel Dispenser and Waste Receptacle B-3947
8. Toilet Seat Cover Dispensers: Bobrick Recessed Toilet Seat Cover Dispenser B-301
9. Toilet Paper Dispenser: Bobrick Recessed Multi-Roll Toilet Tissue Dispenser B-3888
10. Sanitary Waste Receptacle: Recessed Sanitary Napkin Disposal B-353
11. Wall Mirror: Bobrick Glass Mirror with Stainless Steel Angle Frame: B-290 2472
12. Lighted Mirror: Lighted Mirror Kohler Verdera K-99571-TLC
13. Grab Bars: Straight Grab Bars Series No. B-6806; 18 gage 1-1/2 inch o.d. stainless steel tubing; provide sizes as shown.
14. Two-Wall Grab Bar: Bobrick B-68137
15. Shower Seat: Reversible Solid Phenolic Folding Shower Seat: Bobrick B-5181
16. Collapsible Shower Dam/Threshold: Trademark Hardware TMH Shower Threshold, accessible
17. Under sink guards: Plumberex Handy-Shield trap cover
18. Stainless Steel Shelf: Bobrick B-298x24

# EXHIBIT C

## Toilet & Shower Accessories Section 10 2800

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- D. Fasteners: As recommended by manufacturer; tamperproof type.
- E. Blocking: Provide solid wood blocking in the walls for the mounting of all accessories

### PART 3- EXECUTION

#### 3.1 PREPARATION

- A. Examination: Examine conditions of surface in place before beginning work; report defects.
- B. Measurements: Take field measurements; report variance between plan and field dimensions.

#### 3.2 INSTALLATION

- A. General: Install in conformance with referenced standards, manufacturer's written directions, mounting heights and locations as required to open and service units, and as specified.
- B. Toilet Room Accessories: Install with concealed vandal-proof fasteners where mountings are made without back plates and where accessories are recessed or faster is exposed to view. Attach accessories securely to walls or toilet partitions as recommended by manufacturer for each item and each condition; adhesive installation not permitted.

#### 3.3 ADJUSTMENT

- A. General: Prior to acceptance, adjust moveable parts to assure smooth operation.

#### 3.4 CLEANING

- A. General: Upon completion, thoroughly clean exposed surfaces per manufacturer's instruction.

END OF SECTION 10 2800



# EXHIBIT C

Fire Protection Specialties Section 10 4400

## FIRE PROTECTION SPECIALTIES SECTION 10 4400

### PART 1-GENERAL

#### 1.1 SUMMARY

A. Description: Provide Fire Extinguishers and Cabinets, as shown and specified per Contract documents.

#### 1.2 SUBMITTALS

A. General: GENERAL CONDITIONS.

B. Product Data: None required for specified products; required for alternate products.

C. Certificates: Submit manufacturer's certificate stating that materials meet or exceed specified requirements

D. Closeout:

1. General: Refer to GENERAL CONDITIONS.

2. Maintenance Data: Manufacturer's instructions.

3. Guarantee: Provide in required form for a period of one (1) year from date of final acceptance by Owner.

#### 1.3 QUALITY REQUIREMENTS

A. General: Refer to GENERAL CONDITIONS.

B. Reference Standards:

1. General: Refer to GENERAL CONDITIONS for reference standards, applicable codes and definitions.

2. American National Standards Institute (ANSI):

a. ANSI/NFPA 10: Portable Fire Extinguishers.

b. ANSI/UL 711: Rating and Fire Testing of Fire Extinguishers.

3. National Fire Protection Association (NFPA): Fire Extinguisher Standards.

4. Underwriters Laboratories (UL): Listing for type, rating and classification of extinguisher.

C. Qualifications: Installer specializing in the work of this Section with minimum three (3) years documented experience; manufacturer and approved.

### PART 2- PRODUCTS

#### 2.1 MATERIALS

A. General: Refer to GENERAL CONDITIONS

B. Manufacture:

1. General: Products manufactured by the Potter-Roemer Division of Smith Industries, Inc.

# EXHIBIT C

## Fire Protection Specialties Section 10 4400

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2. Alternate Manufacturers: Comparable products manufactured by J.L. Industries, or accepted equal.
- C. Extinguishers:
1. General: Fire fighting devices must be approved by Underwriters' Laboratories, Inc., bear UL label, and be approved by Fire Marshal
  2. Provide 2A10BC extinguishers.
- D. Fire Extinguisher Cabinets:
1. Recessed Type: Fire extinguisher cabinet shall a recessed type with 20-gauge flanged epoxy coated factory finished steel box, sized to hold specified extinguisher. Verify extinguisher size compatibility and wall depth requirements. Box interior shall be white. Cabinet door to be white epoxy primed coated cold rolled steel door oversized to completely cover the flange, with a concealed hinge and concealed handle. Doors to consist of a formed design with 7/8" nominal thickness. Door to contain 1/4" clear view glass. Lettering shall state "FIRE EXTINGUISHER" in red letters vertically.
- E. Fasteners: As recommended by manufacturer.

### PART 3- EXECUTION

#### 3.1 PERFORMANCE

- A. General: Refer to GENERAL CONDITIONS

#### 3.2 PREPARATION

- A. Environmental Requirements: Do not install when temperatures may cause freezing of extinguisher ingredients.
- B. Examination: Examine conditions of surface in place before beginning work; report defects.

#### 3.3 INSTALLATION

- A. General: Install in conformance with referenced standards, manufacturer's written directions, as shown, and as specified.
- B. Extinguishers:
1. Cabinet: One (1) extinguisher for each cabinet.

#### 3.4 FIELD QUALITY CONTROL

- A. Service: Inspect, change and tag fire extinguishers not more than (10) days prior to occupancy of building by Owner.

#### 3.5 ADJUSTMENT

- A. General: Prior to acceptance, adjust moveable parts to assure smooth operation.

#### 3.6 CLEANING

- A. General: Upon completion, thoroughly clean exposed surfaces per manufacturer's instruction.

**END OF SECTION 10 4400**

# EXHIBIT C

Window Roller Shades Section 12 2413

## WINDOW ROLLER SHADES SECTION 12 2413

### PART 1-GENERAL

#### 1.1 SUMMARY

A. Description: Provide Window Roller Shades, as shown and specified per Contract documents.

#### 1.2 SUBMITTALS

A. General: Refer to GENERAL CONDITIONS.

B. Samples: Submit manufacturer's standard colors.

C. Product Data: Submit manufacturer's specifications, data, and installation for review.

D. Closeout:

1. General: Refer to GENERAL CONDITIONS.

2. Maintenance Data: Manufacturer's instructions.

3. Guarantee: Provide in required form for a period of one (1) year from date of final acceptance by Owner.

#### 1.3 QUALITY REQUIREMENTS

A. General: Refer to GENERAL CONDITIONS.

B. Reference Standards: Refer to GENERAL CONDITIONS for reference standards, applicable codes and definitions.

### PART 2- PRODUCTS

#### 2.1 MATERIALS

A. General: Refer to GENERAL CONDITIONS.

B. Roller Blinds:

1. General: Mecho Urban Roller Shades <http://www.mechoshade.com> ; 800-899-8081, or approved equal.

a. Shade Cloth: Thermoveil 0900 Series Shade Cloth, color/pattern as selected by Architect

b. Fascia: Square Fascia, color as selected by Architect

c. Components: Manufacturers standard.

d. Fasteners: As recommended by manufacturer.

e. Operation: manual

# EXHIBIT C

## Window Roller Shades Section 12 2413

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### PART 3- EXECUTION

#### 3.1 PERFORMANCE

A. General: Refer to section GENERAL CONDITIONS.

#### 3.2 PREPARATION

A. Examination: Examine conditions of surface in place before beginning work; report defects.

B. Measurements: Take field measurements prior to fabrication

#### 3.3 INSTALLATION

A. General: Install in conformance with referenced standards, manufacturer's written directions, and as specified, at all windows.

B. Window Roller Shades:

1. General: Install window roller shades, anchorages, fastenings, and accessories as shown, level and in alignment with window openings.

#### 3.4 ADJUSTMENT

A. General: Prior to acceptance, adjust moveable parts to assure smooth operation.

#### 3.5 CLEANING

A. General: Upon completion, thoroughly clean exposed surfaces per manufacturer's instruction.

**END OF SECTION 12 2413**

# EXHIBIT C

Office Furniture Section 12 5100

## OFFICE FURNITURE SECTION 12 5100

### PART 1-GENERAL

#### 1.1 SUMMARY

A. Description: Provide Office Furniture, as shown and specified per Contract documents.

#### 1.2 SUBMITTALS

A. General: Refer to GENERAL CONDITIONS.

B. Samples: Submit manufacturer's standard colors.

C. Product Data: Submit manufacturer's specifications, data, cut sheet, elevation diagrams, materials selections, door operation, product details and installation instructions for review.

D. Closeout:

1. General: Refer to GENERAL CONDITIONS.

2. Maintenance Data: Manufacturer's instructions.

3. Guarantee: Provide in required form for a period of one (1) year from date of final acceptance by Owner.

#### 1.3 QUALITY REQUIREMENTS

A. General: Refer to GENERAL CONDITIONS.

B. Reference Standards: Refer to GENERAL CONDITIONS for reference standards, applicable codes and definitions.

### PART 2- PRODUCTS

#### 2.1 MATERIALS

A. General: Refer to GENERAL CONDITIONS.

B. Office Furniture:

1. General: Manufacturer: Teknion Architectural Interiors, available through The Collective, (916)930-0365, 1329 T Street, Sacramento, CA 95811

2. Furniture: Teknion Tek Room, accessible Tek Room

1. Exterior dimensions 96" wide x 70-1/8" deep x 90" high

2. Stainless steel accessible threshold

3. Pivot door with compliant hardware and automated operator, door kickplate, and brush pile door seal

# EXHIBIT C

## Office Furniture Section 12 5100

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4. Glass sidelights
5. Square corner trim
6. Rear panel glass with 36" window sill
7. Side laminate worksurface with data module
8. Perforated base fascia with punchout preps and grommet kit
9. Occupancy sensor
10. Ventilation with (4) low-noise ceiling fans and base fascia exhaust
11. Power duplex and USB
12. Fully dimmable ceiling light
13. Plug-in electrics
14. Colors and finishes as selected by architect

### PART 3- EXECUTION

#### 3.1 PERFORMANCE

- A. General: Refer to section GENERAL CONDITIONS.

#### 3.2 PREPARATION

- A. Examination: Examine conditions of surface in place before beginning work; report defects.
- B. Measurements: Take field measurements prior to ordering to confirm fit.

#### 3.3 INSTALLATION

- A. General: Install in conformance with referenced standards, manufacturer's written directions, and as specified, level and true.

#### 3.4 ADJUSTMENT

- A. General: Prior to acceptance, adjust moveable parts to assure smooth operation.

#### 3.5 CLEANING

- A. General: Upon completion, thoroughly clean exposed surfaces per manufacturer's instruction.

**END OF SECTION 12 5100**

# EXHIBIT C

Performance Specifications for Fire Suppression Section 21 0000

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## PERFORMANCE SPECIFICATIONS FOR FIRE SUPPRESSION

SECTION 21 0000

### SECTION 21 05 13 - COMMON MOTOR REQUIREMENTS FOR FIRE SUPPRESSION EQUIPMENT

1. Polyphase Motors:
  - A. Design B, medium induction motors, premium efficient.
  - B. Service Factor: 1.15
  - C. Rotor: Random-wound, squirrel cage.
  - D. Bearings: Regreasable, shielded, antifriction ball bearings suitable for radial and thrust loading.
  - E. Premium-efficient and Inverter-duty motors used with variable frequency controllers.
2. Single-Phase Motors:
  - A. Motors Larger than 1/20 HP: Permanent-split capacitor; split phase; capacitor start, inductor run; or capacitor start, capacitor run to suit starting torque and requirements of specific motor application.
  - B. Multispeed Motors: Variable-torque, permanent-split-capacitor type.
  - C. Bearings: Prelubricated, antifriction ball bearings or sleeve bearings suitable for radial and thrust loading.
  - D. Motors 1/20 HP and Smaller: Shaded-pole type.
  - E. Internal thermal protection.

### SECTION 21 05 17 - SLEEVES AND SLEEVE SEALS FOR FIRE SUPPRESSION PIPING

1. Provide sleeve seals for sleeves located in foundation walls below grade or in exterior walls.
2. Provide unions at each threaded or soldered connection to all equipment, tanks and valves.
3. Where pipes pass through concrete floors or walls, install plastic sleeves having not less than 1/2 inch or more than 1 inch clearance around sides of the pipe or pipe covering for the full thickness of the concrete. Extend sleeves through floors one inch above floor and seal watertight.
4. After piping has been installed, fill annular space with UL listed fire stopping system, 3M, Fire Barrier, Dow Firestop or Nelson Firestop. All through-wall firestop penetrations shall comply

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## Performance Specifications for Fire Suppression Section 21 0000

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with the requirements of Section 07 84 13.

5. The annular space between the pipe sleeves and the pipe and between duct openings and ducts through all floors and walls shall be fire resistant. Seal duct penetrations with an incombustible material.
6. Install unions and flanges so that piping can be easily disconnected for removal of tanks, equipment, and valves.
7. Do not locate piping over or within 3 feet horizontally of electrical equipment

### **SECTION 21 05 18 - ESCUTCHEONS FOR FIRE SUPPRESSION PIPING**

1. Provide chrome plated brass pipe escutcheons with inside diameter closely fitting pipe outside diameter or outside of pipe insulation where pipe is insulated.
2. Select outside diameter of escutcheon to completely cover pipe penetration hole in floors, walls, ceilings, or pipe sleeve extension, if any.
3. Provide cast brass or sheet brass escutcheons, solid or split hinged.
4. One-Piece Floor Plates: Cast-iron flange with holes for fasteners.
5. Install escutcheons for piping penetrations of walls, ceilings, and finished floors.
6. Install escutcheons with ID to closely fit around pipe, tube, and insulation of piping and with OD that completely covers opening.
7. Piping with Fitting or Sleeve Protruding from Wall: One-piece, deep-pattern type.
8. Insulated Piping: One-piece, stamped-steel type or Split-plate, stamped-steel type with concealed hinge.
9. Bare Piping at Wall, Floor or Ceiling Penetrations in Finished Spaces: One-piece, cast-brass type; chrome plated.
10. Bare Piping in Unfinished Service Spaces or equipment rooms: One-piece, cast-brass type; rough-brass finish or Split-casting brass type, rough-brass finish.
11. Install floor plates for piping penetrations of equipment-room floors.
12. Install floor plates with ID to closely fit around pipe, tube, and insulation of piping and with OD that completely covers opening.
13. Floor Plates for New Piping: One-piece type.

### **SECTION 21 05 23 - GENERAL-DUTY VALVES FOR FIRE SUPPRESSION PIPING**

1. UL Listed: Valves shall be listed in UL's "Online Certifications Directory" and shall bear UL mark:



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## Performance Specifications for Fire Suppression Section 21 0000

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2. FM Global Approved: Valves shall be listed in its "Approval Guide".
3. Source Limitations for Valves: Obtain valves for each valve type from single manufacturer.
4. ASME Compliance:
  - A. ASME B16.1 for flanges on iron valves.
  - B. ASME B1.20.1 for threads for threaded-end valves.
  - C. ASME B31.9 for building services piping valves.
5. AWWA Compliance: Comply with AWWA C606 for grooved-end connections.
6. NFPA Compliance: Comply with NFPA 24 for valves.
7. Valve Pressure Ratings: Not less than the minimum pressure rating indicated or higher as required by system pressures.
8. Valve Sizes: Same as upstream piping unless otherwise indicated.
9. Valve Actuator Types:
10. Worm-gear actuator with handwheel for quarter-turn valves, except for trim and drain valves.
  - A. Handwheel: For other than quarter-turn trim and drain valves.
  - B. Handlever: For quarter-turn trim and drain valves NPS 2 and smaller.
11. Angle, Check, and Globe Valves: Fed. Spec WW-V-51; Class A, type as suitable for application. Select check valves for installation in vertical lines recommended by manufacturer as suitable for vertical installation. Install in vertical lines only where flow is upward.
12. Gate Valves Sizes 1 1/2 inches or less: Fed. Spec WW V 54, Class A.
13. Gate Valves Sizes above 1-1/2 inches: Fed. Spec WW V 58, Class A, designation OS or OF, as required. Provide OS&Y type, 175 pound rated working pressure.
14. Drain Valves: angle, or globe. Fed. Spec WW-V-51; Class A, type as suitable for application. [UL listed and FM approved combination test and drain fittings may be used.]
15. Zone Control Valves: UL listed, outside screw and yoke or butterfly. Valves shall be sealed open with approved seal. Provide weatherproof actuator housing, with two single pole, double throw switches. Supervisory Switch: Fit the control valves on the fire sprinkler risers with supervisory switch, with single pole double throw switch actuator installed to change switch position when valve is being closed.
16. Sprinkler Inspector's Test Fittings:

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## Performance Specifications for Fire Suppression Section 21 0000

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17. Standard: UL's "Fire Protection Equipment Directory" or FM Global's "Approval Guide."
  - A. Pressure Rating: 175-psig minimum.
  - B. Body Material: Cast- or ductile-iron housing with sight glass.
  - C. Integral factory or field-installed pressure relief valve.
  - D. Size: Same as connected piping.
  - E. Inlet and Outlet: Threaded.
18. Install valves with unions or flanges at each piece of equipment arranged to allow service, maintenance, and equipment removal without system shutdown.
19. Locate valves for easy access and provide separate support where necessary.
20. Install valves in horizontal piping with stem at or above center of pipe.
21. Install valve tags. Comply with requirements in Section 220553 "Identification for Plumbing Piping and Equipment" for valve tags and schedules.
22. Adjust or replace valve packing after piping systems have been tested and put into service but before final adjusting and balancing. Replace valves if persistent leaking occurs.

### **SECTION 21 05 48 - VIBRATION AND SEISMIC CONTROLS FOR FIRE SUPPRESSION PIPING AND EQUIPMENT**

1. Calculate static and dynamic loading due to equipment weight and operation, due to seismic forces required to select vibration isolators, and due to seismic restraints.
2. Seismic-restraint devices shall have horizontal and vertical load testing and analysis and shall bear anchorage preapproval OPA number from OSHPD, preapproval by ICC-ES, or preapproval by another agency acceptable to authorities having jurisdiction, showing maximum seismic-restraint ratings. Ratings based on independent testing are preferred to ratings based on calculations. If preapproved ratings are unavailable, submittals based on independent testing are preferred. Calculations (including combining shear and tensile loads) to support seismic-restraint designs must be signed and sealed by a qualified professional engineer.
3. Spring Hangers: Combination Coil-Spring and Elastomeric-Insert Hanger with Spring and Insert in Compression. Frame: Steel, fabricated for connection to threaded hanger rods and to allow for a maximum of 30 degrees of angular hanger-rod misalignment without binding or reducing isolation efficiency. Outside Spring Diameter: Not less than 80 percent of the compressed height of the spring at rated load. Minimum Additional Travel: 50 percent of the required deflection at rated load. Lateral Stiffness: More than 80 percent of rated vertical stiffness. Overload Capacity: Support 200 percent of rated load, fully compressed, without deformation or failure. Elastomeric Element: Molded, oil-resistant rubber or neoprene. Steel-washer-reinforced cup to support spring and bushing projecting through bottom of frame.

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## Performance Specifications for Fire Suppression Section 21 0000

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- Self-centering hanger-rod cap to ensure concentricity between hanger rod and support spring coil. Kinetics Noise Control, Mason, ISAT or equal.
4. Restraint Channel Bracings: Bracing assembly made of slotted steel channels with accessories for attachment to braced component at one end and to building structure at the other end and other matching components and with corrosion-resistant coating; rated in tension, compression, and torsion forces. Cooper B-line, Hilti, Mason, Unistrut or equal.
  5. Restraint Cables: ASTM A 492 stainless-steel cables. End connections made of steel assemblies with thimbles, brackets, swivel, and bolts designed for restraining cable service; with a minimum of two clamping bolts for cable engagement. Kinetics Noise Control, Mason, ISAT or equal.
  6. Housed-Restrained-Spring Isolators:
    - A. Two-Part Telescoping Housing: A steel top and bottom frame separated by an elastomeric material and enclosing the spring isolators. Housings are equipped with adjustable snubbers to limit vertical movement.
      1. Drilled base housing for bolting to structure with an elastomeric isolator pad attached to the underside. Bases shall limit floor load to 500 psig.
      2. Threaded top housing with adjustment bolt and cap screw to fasten and level equipment.
    - B. Outside Spring Diameter: Not less than 80 percent of the compressed height of the spring at rated load.
    - C. Minimum Additional Travel: 50 percent of the required deflection at rated load.
    - D. Lateral Stiffness: More than 80 percent of rated vertical stiffness.
    - E. Overload Capacity: Support 200 percent of rated load, fully compressed, without deformation or failure.
  7. Elastomeric Isolation Pads:
    - A. Fabrication: Single or multiple layers of sufficient durometer stiffness for uniform loading over pad area.
    - B. Size: Factory or field cut to match requirements of supported equipment.
  8. Coordinate the location of embedded connection hardware with supported equipment attachment and mounting points and with requirements for concrete reinforcement and formwork specified in Section 033000 "Cast-in-Place Concrete."
  9. Piping Restraints:
    - A. Comply with requirements in MSS SP-127.

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## Performance Specifications for Fire Suppression Section 21 0000

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- B. Space lateral supports a maximum of 40 feet o.c., and longitudinal supports a maximum of 80 feet o.c.
  - C. Brace a change of direction longer than 12 feet
10. Install cables so they do not bend across edges of adjacent equipment or building structure.
11. Adjust limit stops on restrained-spring isolators to mount equipment at normal operating height. After equipment installation is complete, adjust limit stops so they are out of contact during normal operation.

### SECTION 21 05 53 - IDENTIFICATION FOR FIRE SUPPRESSION PIPING AND EQUIPMENT

1. Equipment Labels: Brass or Stainless Steel not less than 2-1/2 by 3/4 inch permanently affixed to substrate. Include equipment's Drawing designation or unique equipment number.
2. Warning Labels: Include caution and warning information, plus emergency notification instructions on engraved multilayer, multicolor plastic label permanently affixed to substrate. Minimum letter size 1/4 inch.
3. Pipe Labels: Pre-printed, color-coded plastic with identification of piping service using same designations or abbreviations as used on Drawings and an arrow indicating flow direction. Lettering shall be at least 1-1/2 inches high.
4. Valve Tags: Stamped or engraved stainless steel or brass tag with 1/4-inch letters for piping system abbreviation. Permanently attach to valve.
5. Coordinate installation of identifying devices with access panels and doors, and completion of covering and painting of surfaces where devices are to be applied.
6. Equipment Schedules: For each labeled item of equipment, tabulate equipment identification number and identify Drawing numbers where equipment is indicated (plans, details, and schedules), plus the Specification Section number and title where equipment is specified. Equipment schedule shall be included in operation and maintenance data.
7. Valve Schedules: For each piping system, tabulate valve number, piping system, system abbreviation (as shown on valve tag), location of valve (room or space), normal-operating position (open, closed, or modulating), and variations for identification. Mark valves for emergency shutoff and similar special uses. Valve schedule shall be included in operation and maintenance data.
8. Pipe labels: Locate pipe labels where piping is exposed or above accessible ceilings in finished spaces; machine rooms; accessible maintenance spaces such as shafts, and plenums; near each valve and control device; near each branch connection, excluding short takeoffs for fixtures and terminal units; where flow pattern is not obvious, mark each pipe at branch; near penetrations through walls, floors, ceilings, and inaccessible enclosures; at access doors, manholes, and similar access points that permit view of concealed piping; near major equipment items and other points of origination and termination; spaced at maximum intervals of 50 feet along each run.

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## Performance Specifications for Fire Suppression Section 21 0000

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### SECTION 21 13 13 - WET-PIPE SPRINKLER SYSTEMS

1. Conform with requirements of NFPA 13 & 14 for steel pipe, copper tube, and fittings used in fire sprinklers and standpipe systems. All materials and components to be listed by the State Fire Marshal.
2. Pipe for installation above ground shall conform to ASTM A 795, A 53, or A135.
  - A. Schedule 40 pipe with Victaulic or welded couplings may be used for fire lines 3" and larger.
  - B. Piping for line sizes 2½" and smaller shall be Schedule 40 pipe with screwed fittings.
  - C. No thin wall pipe shall be used in conjunction with screwed fittings.
3. Manual Wet-Type, Class I Standpipes: Schedule 40 black steel with 300 psi galvanized fittings.
4. Pipe Fittings: Pipe fittings for installation below ground shall be cement lined, cast iron conforming to the requirements of American Water Works Association Standard Specification for cast iron special castings, Class D, 150 lb., AWWA C151 mechanical or push-on joint; with AWWA C104 cement-mortar lining, "Blue Brut" or PVC pressure pipe AWWA C900, UL approved for fire line service.
5. Hangers and Supports:
  - A. Support piping so that it is firmly held in place by approved iron hangers and supports and by special hangers as required in accordance with NFPA 13.
  - B. Hangers shall support loads specified in NFPA 13, and, in addition, shall support weight of pipe, fluid and pipe insulation, based on spacing between supports with minimum factor of safety of five based on ultimate strength of material used. Do not exceed manufacturer's load rating.
  - C. Pipe attachments, or hangers, shall be of same size as pipe or tubing on which used, or nearest larger size available. Materials, design, and type numbers per Manufacturers' Standardization Society (MSS) Standard Practice SP 58, provide branch line restraints where hangers exceed 6 inches long, in accordance with NFPA 13.
  - D. Install concrete anchors required. Hanger material shall be approved by Architect before installation. Do not support piping by plumbers' tape, wire, rope, wood or other makeshift devices.
6. Seismic bracing system shall be a complete pre-engineered bracing system. Pre-engineered bracing system shall include plan layout, brace selection, specification, and calculations.
7. Seismic Separation Assembly: Provide seismic separation assembly as defined in NFPA 13

# EXHIBIT C

## Performance Specifications for Fire Suppression Section 21 0000

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at locations where piping crosses building seismic joints and at locations where required to prevent pipe breakage due to building movement.

8. Accessories:
  - A. Electric sprinkler alarm switch: Single pole, double throw, Voltage 125 volts a.c.
  - B. Water flow indicators: Two SPDT circuit switches, for isolated alarm and auxiliary contacts. Minimum working pressure 250 psi.
  - C. Gauges: Marsh "Quality Gage", U.S. Gage, Danton 800, or equal, U.L. listed, with bronze bushed movement and front recalibration. Dials shall be white with black numerals, 3 1/2 inch dial face. Normal reading shall be at midscale. Provide a three-way valve on each gauge connection.
  
9. Sprinkler Heads:
  - A. Upright sprinkler heads: Location: All areas without ceilings. Finish: selected by design/builder. Orifice size: 1/2 inch diameter. Fast response type.
  - B. Pendant sprinklers: Sprinkler head finish: Satin Chrome. Orifice size: 1/2 inch diameter. Escutcheon type: Recessed. Escutcheon finish: selected by design/builder. Protection below ceiling: 7/8 inch. Fast response type.
  - C. Sidewall sprinkler heads: Satin chrome, fast response.
  - D. Inmate accessible sprinkler heads: Institutional style.
  - E. Extended coverage heads shall be limited to special circumstances and only as approved by the State Fire Marshal.
  - F. Center heads in center of square ceiling tiles. Arrange other heads symmetrically and uniformly.

### SECTION 21 31 13 – ELECTRIC-DRIVE, CENTRIFUGAL FIRE PUMPS

1. Factory-assembled and -tested fire-pump and driver unit.
2. Base: Fabricated and attached to fire-pump and driver unit with reinforcement to resist movement of pump during seismic events when base is anchored to building substrate.
3. Finish: Red paint applied to factory-assembled and -tested unit before shipping.
4. In-Line Fire Pumps
  - A. Standard: UL 448, for in-line pumps for fire service.
  - B. Casing: Radially split case, cast iron with ASME B16.1 pipe-flange connections.
  - C. Impeller: Cast bronze, statically and dynamically balanced, and keyed to shaft.

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## Performance Specifications for Fire Suppression Section 21 0000

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- D. Wear Rings: Replaceable bronze.
  - E. Shaft and Sleeve: Steel shaft with bronze sleeve.
  - F. Shaft Bearings: Grease-lubricated ball bearings in cast-iron housing.
  - G. Seals: Stuffing box with minimum of four rings of graphite-impregnated braided yarn and bronze packing gland.
  - H. Mounting: Pump and driver shaft is vertical, with motor above pump and pump on base.
  - I. Coupling: None or rigid.
  - J. Driver: Standard: UL 1004A. Type: Electric motor; NEMA MG 1, polyphase Design B.
5. Multistage, Pressure-Maintenance Pumps
- A. Factory-assembled and -tested, multistage, barrel-type vertical pump as defined in HI 2.1-2.2 and HI 2.3; designed for surface installation with pump and motor direct coupled and mounted vertically.
  - B. Barrel: Stainless steel.
  - C. Suction and Discharge Chamber: Cast iron with flanged inlet and outlet.
  - D. Pump Head/Motor Mount: Cast iron.
  - E. Impellers: Stainless steel, balanced, and keyed to shaft.
  - F. Pump Shaft: Stainless steel.
  - G. Seal: Mechanical type with carbon rotating face and silicon-carbide stationary seat.
  - H. Intermediate Chamber Bearings: Aluminum-oxide ceramic or bronze.
  - I. Chamber-Base Bearing: Tungsten carbide.
  - J. O-Rings: EPDM or NBR.
  - K. Motor: Single speed with permanently lubricated ball bearings and rigidly mounted to pump head. Comply with requirements in Section 210513 "Common Motor Requirements for Fire Suppression Equipment."
  - L. Power Cord: Factory-connected to motor for field connection to controller.
  - M. Nameplate: Permanently attached to pump and indicating capacity and characteristics.

# EXHIBIT C

## Performance Specifications for Fire Suppression Section 21 0000

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6. Comply with NFPA 20 for installation of fire pumps, relief valves, and related components.
7. Align pump and driver shafts after complete unit has been leveled on concrete base, grout has set, and anchor bolts have been tightened.
8. Install piping adjacent to pumps and equipment to allow service and maintenance.
9. Test each fire pump with its controller as a unit.
10. Manufacturer's Field Service: Engage a factory-authorized service representative to inspect components, assemblies, and equipment installations, including connections, and to assist in testing.
11. Engage a factory-authorized service representative to train Owner's maintenance personnel to adjust, operate, and maintain fire pumps.

**END OF SECTION 21 0000**



# EXHIBIT C

## Plumbing Requirements

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# PLUMBING REQUIREMENTS

SECTION 22 00 00

## PART 1 - GENERAL

### 1.1 SUMMARY

- A. Work Included: Work included in 22 00 00 applies to Division 22 work to provide materials, labor, tools, permits and incidentals to make plumbing systems ready for Owner's use for proposed project.
- B. Related Work Specified Elsewhere:
  - 1. Contents of Section applies to Division 22 specifications.
  - 2. Requirements of Section are a minimum for Division 22 Sections, unless otherwise stated in each Section, in which case that Section's requirements take precedence.
- C. Products Furnished but not Installed under Division 22:

### 1.2 DEFINITIONS

- A. Following is a list of abbreviations generally used in Division 22:
  - 1. ADA Americans with Disabilities Act
  - 2. AHJ Authority Having Jurisdiction
  - 3. ANSI American National Standards Institute
  - 4. ARI Air-Conditioning & Refrigeration Institute
  - 5. ASHRAE American Society of Heating, Refrigerating and Air-Conditioning Engineers
  - 6. ASME American Society of Mechanical Engineers
  - 7. ASTM American Society for Testing and Materials
  - 8. ASSE American Society of Sanitary Engineering
  - 9. AWWA American Water Works Association
  - 10. CBC California Building Code
  - 11. CEC California Electrical Code
  - 12. CMC California Mechanical Code
  - 13. CPC California Plumbing Code
  - 14. CISPI Cast Iron Soil Pipe Institute
  - 15. ETL Electric Testing Laboratories
  - 16. FM FM Global
  - 17. HI Hydraulic Institute Standards
  - 18. HVAC Heating, Ventilating and Air Conditioning
- B. Provide: To furnish and install, complete and ready for the intended use.
- C. Furnish: Supply and deliver to the project site, ready for unpacking, assembly and installation.
- D. Install: Includes unloading, unpacking, assembling, erecting, installation, applying, finishing, protecting, cleaning and similar operations at the project site as required to complete items of work furnished by others.

### 1.3 ADDITIONAL REQUIREMENTS TO DIVISION 01

- A. Operation and Maintenance Documentation: Copies of certificates of code authority acceptance, test data, parts lists, maintenance information for equipment, valves, balancing reports, and other

# EXHIBIT C

## Plumbing Requirements

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special guarantees, certificates of warranties, and the like, specified elsewhere herein or indicated on Drawings.

B. Shop Drawings: Provide shop drawings which include physical characteristics, electrical characteristics, device layout plans, wiring diagrams, and the like. Refer to individual Specification Sections for additional requirements for the shop drawings.

C. Closeout Documentation: Submit plumbing code authority certification of inspection.

D. Record Drawings:

1. Show changes and deviations from the Drawings. Include issued Addendum and change order items.
2. Make changes to the Drawings in a neat, clean, and legible manner.

E. Product Data:

1. Submit manufacturer's technical data, installation instructions and dimensioned drawings for products, fixtures, equipment and devices installed, supplied or provided. Refer to individual specification sections for specific items required in product data submittal. Submit at one time in 3-ring binder, tabbed and referenced to match the Contract Documents.
2. Maintain an updated product submittal package to be included in the final operation and maintenance documentation.

### 1.4 QUALITY ASSURANCE

A. Where Contract Documents are at variance with applicable codes governing work, code and local jurisdiction requirements take precedence, and include cost necessary for code compliance or local jurisdiction compliance in bid price. Machinery and equipment to comply with Occupational Safety and Health Act of 1970, as currently revised, as interpreted for equipment manufacturer requirements.

B. Plumbing Drawings: Drawings are intended to be diagrammatic and are based on one manufacturer's equipment. They are not intended to show every item in its exact dimensions, or details of equipment or proposed systems layout. Verify actual dimensions of systems (i.e., piping) and equipment proposed to assure that systems and equipment will fit in available space. Contractor is responsible for design and construction costs incurred for equipment other than basis of design, including but not limited to architectural, structural, electrical, HVAC, fire sprinkler, and plumbing.

C. Requirements: As a minimum requirement, work in accordance with following rules and regulations and applicable laws:

1. NFPA.
2. CalOSHA.
3. Related supplements and standards.
4. California State Energy Code.
5. CBC California Building Code
6. CMC California Mechanical Code
7. CPC California Plumbing Code
8. State of California and local jurisdictional requirements.

D. Permits and Inspections:

1. Unless otherwise distinctly hereinafter specified, apply and pay for necessary permits, plans check, and inspections required by public AHJ.
2. Refer to General and Supplementary Conditions for payment of water and sewer service connection fees.

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## Plumbing Requirements

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3. Obtain certificates of inspection from AHJs and deliver to Owner before final acceptance.
4. Each trade to consult local building department and utility companies prior to commencement of work to ascertain existence and location of existing underground utilities. Protect existing service against damage and interruption of use, and reroute as may be necessary to accomplish new work. Include costs for materials and installation for rerouting as specified for new work in bid price.

E. Regulatory Requirements:

1. UL and CSA Compliance: Provide units which are CSA listed.
2. ASME Compliance: Provide units which are ASME listed when water heaters and boilers which exceed 200,000 BTUH, hot water storage tanks which exceed 120 gallons, and hot water expansion tanks which are connected to ASME rated equipment or required by code or local jurisdiction.

### 1.5 SEQUENCING AND SCHEDULING

- A. For proper execution of work cooperate with other trades as needed.
- B. To avoid installation conflicts, thoroughly examine complete set of Contract Documents. Resolve conflicts with Architect prior to fabrication and installation.
- C. Prior to installation of equipment requiring electrical connections, examine manufacturer's shop drawings, wiring diagrams, product data, and installation instructions. Verify that electrical characteristics indicated in Contract Documents are consistent with electrical characteristics of actual equipment being installed. When inconsistencies occur request clarification from Architect.

### 1.6 COORDINATION DOCUMENTS

- A. Prepare and submit coordinated layout drawings, prior to construction, to coordinate installation and location of ductwork, grilles, diffusers, piping, fire sprinklers, plumbing, lights, and electrical services. Composite Drawings show services on single sheet. Key Drawings to structural column identification system, and progressively number. Prior to completion of Drawings, coordinate proposed installation with architectural and structural requirements, and other trades (including plumbing, HVAC, fire protection, electrical, ceiling suspension, and tile systems), and provide reasonable maintenance access requirements.
- B. Prepare Drawings as follows:
  1. Prepare Drawings to accurate scale of 1/4 inch = 1 foot or larger on Mylar sheets or AutoCAD. Drawings are to be same size as Contract Drawings and to indicate location, size and elevation above finished floor of plumbing equipment and piping. Drawings indicate proposed ceiling grid and lighting layout as shown on electrical drawings and reflected ceiling drawings.
  2. Review and revise as necessary section cuts in Contract Drawings after verification of field conditions.
  3. Indicate plumbing system piping including fittings, hangers, access panels, valves, and bottom of pipe elevations above finished floor.
  4. Piping that must be graded to have right-of-way over more flexible items. Drawings also to indicate proposed ceiling grid and lighting layout as shown on electrical drawings and reflected ceiling drawings and HVAC equipment, ductwork and piping.
  5. Drawings are to incorporate Addenda items and change orders.
  6. Distribute drawings to trades and provide additional coordination as needed.
- C. Advise Architect, in event a conflict occurs in location or connection of equipment. Bear costs resulting from failure to properly coordinate installation or failure to advise Architect of conflict.

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- D. Verify in field exact size, location, invert, and clearances regarding existing material, equipment and apparatus, and advise Architect of discrepancies between that indicated on Drawings and that existing in field prior to installation related thereto.
- E. Final coordination drawings with appropriate information added to be submitted as Record Drawings at completion of project.

### 1.7 COORDINATION DOCUMENTS

- A. Prior to construction, coordinate installation and location of HVAC equipment, ductwork, grilles, diffusers, piping, plumbing equipment/fixtures, fire sprinklers, plumbing, lights, and electrical services with architectural and structural requirements, and other trades (including plumbing, fire protection, electrical, ceiling suspension, and tile systems), and provide reasonable maintenance access requirements.

## PART 2 - PRODUCTS

### 2.1 HAZARDOUS MATERIALS

- A. Do not use products containing asbestos, lead, arsenic, or other material defined by EPA as hazardous to human or animal life.

### 2.2 MATERIALS

- A. Base contract upon furnishing materials as specified. Materials, equipment, and fixtures used for construction are to be new, the latest products as listed in manufacturer's printed catalog data and are to be UL or CSA approved or acceptable by state, county, and city authorities. Equipment supplier is responsible for obtaining state, county, and city acceptance on equipment not UL approved or not listed for installation.
- B. Articles, fixtures, and equipment of a kind to be standard product of one manufacturer.
- C. Names and manufacturer's names denote character and quality of equipment desired and are not to be construed as limiting competition.

## PART 3 - EXECUTION

### 3.1 ACCESSIBILITY AND INSTALLATION

- A. Install equipment having components requiring access (i.e., drain pans, drains, control operators, valves, motors, drives, and the like) so that they may be serviced, reset, replaced or recalibrated and the like, by service people with normal service tools and equipment. Notify Architect in writing if equipment or components are shown in such a position that above cannot be accomplished.
- B. Install equipment complete as directed by manufacturer's installation instructions. Obtain installation instructions from manufacturer prior to rough-in of equipment, examine instructions thoroughly. When requirements of installation instructions conflict with Contract Documents, request clarification from Architect prior to proceeding with installation. This includes proper installation methods and sequencing, in coordination with other trades and disciplines.
- C. Earthwork:
  - 1. Refer to Division 31.
  - 2. Perform excavation and backfill for installation of plumbing work.
- D. Firestopping:

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## Plumbing Requirements

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1. Coordinate with Drawings location of fire rated walls, ceilings, floors and the like. When these assemblies are penetrated, seal around piping, equipment, and the like, with approved firestopping material.
2. Install firestopping material complete as directed by manufacturer's installation instructions. Meet requirements of ASTM E814.

### 3.2 SEISMIC CONTROL

#### A. Provide Vibration and Seismic Controls for Plumbing Piping and Equipment.

1. General:
  - a. Earthquake resistant designs for plumbing equipment, i.e., water heaters, motors, and plumbing piping, to conform to regulations of CEC.
  - b. Restraints which are used to prevent disruption of function of piece of equipment because of application of horizontal force to be such that forces are carried to frame of structure in such a way that frame will not be deflected when apparatus is attached to a mounting base and equipment pad, or to structure in normal way, utilizing attachments provided. Secure equipment piping and the like, to withstand a force in direction equal to value defined in CEC.
2. Piping:
  - a. Use "Seismic Restraints Manual Guidelines for Plumbing Systems," published by SMACNA.
  - b. Sway bracing is not required for pipes that are installed on very short individual hangers (12 inch or less).
  - c. As approved by code authority, use a bracing system manufactured by Tolco, Superstrut, Mason, or Pipe Shields Inc. or approved.
3. Equipment:
  - a. Provide a means to prohibit excessive motion of plumbing equipment during earthquake.
  - b. Provide plumbing equipment, both hanging and base mounted, with mounting connection points of sufficient strength to resist lateral seismic forces equal to 0.5 of equipment operating weight.

### 3.3 ELECTRICAL INTERLOCKS

- #### A. Where equipment motors are to be electrically interlocked with other equipment for simultaneous operation, utilize plumbing equipment wiring diagrams to coordinate with electrical systems so that proper wiring of equipment involved is affected.

### 3.4 EQUIPMENT SELECTION AND SERVICEABILITY

- #### A. Replace or reposition equipment which is too large or located incorrectly to permit servicing, at no additional cost to Owner.
- #### B. Maintain design intent where equipment other than as shown in Contract Documents is provided. Where equipment requires piping arrangement, control diagrams, or sequencing different from that

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## Plumbing Requirements

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indicated in Contract Documents, provide electrical motors, wiring, controls, or other required electrical components at no additional cost to Owner.

### 3.5 DELIVERY, STORAGE AND HANDLING

- A. Deliver, store and handle materials and equipment in a manner to prevent damage and deterioration. Store in original container which identifies manufacturer's name, brand and model number. Do not store indoor equipment outdoors unless provided with a waterproof protective cover.
- B. Replacement: In event of damage, immediately make repairs and replacements necessary.

### 3.6 DEMONSTRATION

- A. Upon completion of work and adjustment of equipment, test systems to demonstrate to Owner's Representative and Architect that equipment furnished and installed or connected under provisions of these Specifications functions mechanically in manner required.
- B. Manufacturer's Field Services: Furnish services of a qualified person for a period of not less than 8 hours, at a time approved by Owner, to instruct maintenance personnel, correct defects or deficiencies, and demonstrate to satisfaction of Owner that entire system is operating in a satisfactory manner and complies with requirements of other trades or Contractors that may be required to complete work. Complete instruction and demonstration prior to final job site observations.

### 3.7 CLEANING

- A. Upon completion of installation, thoroughly clean exposed portions of equipment, removing temporary labels and traces of foreign substances. Throughout work, remove construction debris and surplus materials accumulated by this work.

### 3.8 INSTALLATION

- A. Install equipment and fixtures in accordance with manufacturer's installation instructions, plumb and level, firmly anchored to vibration isolators. Maintain manufacturer's recommended clearances.
- B. Start up equipment, in accordance with manufacturer's start-up instructions, and in presence of manufacturer's representative. Test controls and demonstrate compliance with requirements. Replace damaged or malfunctioning controls and equipment.
  - 1. Do not place equipment in sustained operation prior to initial balancing of plumbing systems.
  - 2. Furnish sufficient dry nitrogen for pressure testing under manufacturer's supervision.
  - 3. Provide and install pump impellers to obtain design capacities. Coordinate exact requirements with balancing firm.

### 3.9 ACCEPTANCE

- A. System cannot be considered for acceptance until work is completed and demonstrated to Architect that installation is in strict compliance with Specifications, Drawings and manufacturer's installation instructions, particularly in reference to following:
  - 1. Testing and balancing reports.
  - 2. Cleaning.
  - 3. System balancing and balancing logs.
  - 4. Operating and Maintenance Manuals.
  - 5. Training of operating personnel.

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## Plumbing Requirements

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6. Record Drawings.
7. Guaranty certificates.
8. Start-up and test document.

END OF SECTION 22 00 00

# EXHIBIT C

## Plumbing Requirements

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# PLUMBING MATERIALS AND METHODS

SECTION 22 01 00

## PART 1 - GENERAL

### 1.1 SUMMARY

#### A. Work Included:

1. Materials, installation and testing of pipe, tubing and fittings, and valves.
2. Refer to Specification Sections for each system medium (i.e., plumbing, hydronics, gas, and the like) for pipe application.
3. Rooftop equipment supports.
4. Plumbing identification materials.
5. Seismic/vibration isolation.

### 1.2 QUALITY ASSURANCE

#### A. Manufacturer's Inspection: Inspect flanges, fittings and field applied welds in accordance with manufacturer's standard written quality control procedure in accordance with the following techniques:

1. Visual Method: Comply with MSS SP-55 except as otherwise indicated.
2. Radiographic (X-Ray) Method: Employ wherever recommended or required for pressurized piping systems.

### 1.3 SUBMITTALS

- A. Piping Materials List: Provide a typewritten list which schedules the piping materials to be used for each system as a function of applicable nominal pipe size ranges. Arrange schedule in outline form for each specific piping system, e.g., "Domestic Water System," "Soil, Waste, and Vent Piping System," and the like. Include ASTM, ANSI or other numbers and other data as necessary to demonstrate compliance with requirements.
- B. Test Procedure: Submit a typewritten checklist type of testing procedure indicating testing medium (i.e., water, air, nitrogen, and the like), pipe service, pipe and fitting type and classification, test pressure, pass/fail criteria and other pertinent data.
- C. Maintenance Data: Submit maintenance data and parts list for each type valve. Include this data, product data, and certifications in maintenance manual.

## PART 2 - PRODUCTS

### 2.1 PRODUCT STANDARDS

- A. References to product Specifications for materials are listed according to accepted base standards. Materials to meet latest approved versions of these standards.
- B. See Section 22 00 00, Plumbing Requirements and Section 22 05 00, General Plumbing Systems where piping materials are approved for use.



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## Plumbing Requirements

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### 2.2 ACCESS PANELS

- A. Provide flush mounting access panels as required for equipment service of cleanouts, valves, and the like, and other items requiring maintenance or inspection. Where access panels are located in fire-rated assemblies of building, rate access panels accordingly. Ceiling access panels to be minimum 24x24 (or required and approved size). Wall access panels to be minimum 12x12 (or required and approved size).
- B. Manufacturers: Milcor, Karp, Elmdor, In-Ryko, Acudor, or approved. Provide two keys for each set of locks provided.

## PART 3 - EXECUTION

### 3.1 INSTALLATION

- A. General Electrical Equipment Clearances: Do not route piping through electrical rooms, transformer vaults, elevator equipment rooms, and other electrical or electronic equipment spaces and enclosures. Within equipment rooms, provide minimum 3-foot lateral clearance from sides of electric switchgear panels. Do not route piping above electric power or lighting panel, switchgear, or similar electric device. Coordinate with electrical and coordinate exact pipe routing to provide proper clearance with such items.
- B. Pressure Piping Routing:
  - 1. Route piping, except as otherwise indicated, vertically and horizontally (sloped to drain). Avoid diagonal runs wherever possible. Orient horizontal routes parallel with walls and beam lines.
  - 2. Install piping as shown or described by diagrams, details and notations on Drawings or, if not indicated, install piping to provide the shortest route which does not obstruct usable space or block access for servicing the building and its equipment.
  - 3. Support piping adjacent to walls, overhead construction, columns and other structural and permanent enclosure elements of the building. Limit clearance to 1/2 inch wherever furring is indicated for concealment of piping. Allow for insulation thickness. Locate insulated piping to provide minimum 1-inch clearance outside insulation.
  - 4. Wherever possible in finished and occupied spaces, conceal piping from view by locating within column or beam enclosures, hollow wall construction, or above suspended ceilings. Do not encase horizontal routes in solid partitions, except where approved.
  - 5. Piping shall be installed only by workers that have been certified to install the specific product.

### 3.2 PIPE AND PIPE FITTINGS

- A. Pipe Sleeves:
  - 1. Lay out work in advance of pouring concrete, furnish, and set sleeves necessary to complete work.
- B. Conform with applicable codes and industry standards.
- C. Install uninsulated piping so that unrestrained direct contact with the structure or other system installations is avoided.
- D. Installation/Coordination:
  - 1. Expansion and Flexibility: Install work with due regard for expansion, contraction, and building settlement to prevent damage to the piping, ductwork, equipment and the building

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## Plumbing Requirements

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and its contents. Provide piping offsets, loops, expansion joints, anchors or other means to control pipe movement, to minimize pipe forces and effects of building settlement.

2. Install piping to prevent stresses and strains to piping and hangers and supports due to expansion or contraction and building settlement. Provide proper loops, guides, offsets, anchor points, or expansion joints. Verify with anticipated settlement or shrinkage of building. Verify construction phasing of project, type of building construction products and type for coordinating installation of piping systems. Include provisions for servicing and removal of equipment without dismantling piping.

### 3.3 ESCUTCHEONS

- A. Install on exposed pipes passing through walls or floors, and on fixture stops and waste connections to wall, except not required in stockrooms.

### 3.4 ACCESSIBILITY

- A. Installation of valves, gauges and equipment conveniently and accessibly located with reference to finished building for repairs, removal and service.
- B. Access Panels: Label access panels with engraved nameplates indicating function of panel. Seton, Bakelite or approved. Nameplates to have 1/4-inch high white letters on black background, unless noted otherwise.

### 3.5 ACCESS PANELS

- A. Install ceiling or wall access panels to provide access to concealed valves, motors, shock arrestors, and other plumbing items needing service. Provide access panels at locations required or as specified herein. Coordinate locations/sizes of access panels with Architect prior to work.

### 3.6 FIRESTOPPING PENETRATIONS IN FIRE-RATED WALL/FLOOR ASSEMBLIES

- A. Provide proper sizing when providing sleeves or core-drilled holes to accommodate the penetration. Firestop voids between sleeve or core-drilled hole and pipe passing through to meet the requirements of ASTM E814.
- B. Manufacturers: Hilti, Proset, or approved.

### 3.7 FIELD QUALITY CONTROL

- A. Upon completion of installation of equipment and plumbing fixtures and after units are water pressurized, test fixtures to demonstrate capability and compliance with requirements. When possible, correct malfunctioning units at site, then retest to demonstrate compliance; otherwise, remove and replace with new units and proceed with retesting.
- B. Inspect each installed unit for damage to finish. If feasible, restore and match finish to original at site; otherwise, remove fixture and replace with new unit. Feasibility and match to be judged by Architect. Remove cracked or dented units and replace with new units.

### 3.8 VALVE INSTALLATION

- A. Install valves where required for proper operation of piping and equipment, including valves in branch lines where necessary to isolate sections of piping. Locate valves so as to be accessible and so that separate support can be provided when necessary.
- B. Install valves with stems pointed up, in vertical position where possible, but in no case with stems pointed downward from horizontal plane unless unavoidable. Install valve drains with hose-end adapter for each valve that must be installed with stem below horizontal plane.

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## Plumbing Requirements

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- C. Insulation: Where insulation is indicated, install extended-stem valves, arranged in proper manner to receive insulation.
- D. Seats: Renewable seats, except where otherwise indicated.
- E. Installation of Check Valves:
  - 1. Swing Check Valves: Install in horizontal position with hinge pin horizontally perpendicular to centerline of pipe. Install for proper direction of flow.
  - 2. Wafer Check Valves: Install between two flanges in horizontal or vertical position, position for proper direction of flow.
  - 3. Lift Check Valves: Install in piping line with stem vertically upward, position for proper direction of flow.

### 3.9 VALVE ADJUSTING AND CLEANING

- A. Inspect valves for leaks. Adjust or replace packing to stop leaks. Replace valve if leak persists.

### 3.10 VALVE IDENTIFICATION

- A. General: Provide valve tag on every valve, cock and control device in each piping system. Exclude check valves, valves within factory fabricated equipment units, plumbing fixture faucets, convenience and lawn-watering hose bibbs, shutoff valves at plumbing fixtures, and similar rough-in connections of end-use fixtures. List each tagged valve in valve schedule for each piping system.
- B. Install mounted valve schedule in each mechanical room.
- C. Provide colored coded round button on ceiling tile below valve location.

### 3.11 PLUMBING EQUIPMENT IDENTIFICATION

- A. General: Install engraved plastic laminate sign or plastic equipment marker on or near each item of plumbing equipment and each operational device, as specified herein if not otherwise specified for each item or device. Provide signs for the following general categories of equipment and operational devices: water heaters, pumps, and similar equipment.

### 3.12 PIPING SYSTEM IDENTIFICATION

- A. Install pipe markers on each system and include arrows to show normal direction of flow.
- B. Locate pipe markers and color bands wherever piping is exposed to view in occupied spaces, machine rooms, accessible maintenance spaces (shafts, tunnels and plenums), and exterior nonconcealed locations, in locations as follows:
  - 1. Near each valve and control device.
  - 2. Near each branch, excluding short take-offs for fixtures and terminal units; mark each pipe at branch, where there could be question of flow pattern.
  - 3. Near locations where pipes pass through walls or floors/ceilings, or enter nonaccessible enclosures.
  - 4. At access doors, manholes and similar access points which permit view of concealed piping.
  - 5. Near major equipment items and other points of origination and termination.
  - 6. Spaced intermediately at maximum spacing of 50 feet along each piping run, except reduce spacing to 25 feet in congested areas of piping and equipment, i.e., mechanical rooms.

### 3.13 ADJUSTING AND CLEANING

- A. Adjusting: Relocate plumbing identification device which has become visually blocked.

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- B. Cleaning: Clean face of identification devices, and glass frames of valve charts.

END OF SECTION 22 01 00

# EXHIBIT C

## General Plumbing Systems

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# GENERAL PLUMBING SYSTEMS

SECTION 22 05 00

## PART 1 - GENERAL

### 1.1 SUMMARY

#### A. Piping system work includes but not limited to:

1. Aboveground soil, waste and vent piping within buildings, including soil stacks, vent stacks, horizontal branches, traps, and connections to fixtures and drains.
2. Underground building drain piping including mains, branches, traps, connections to fixtures and drains, and connections to stacks, terminating at connection to sanitary sewers 5 feet outside foundation wall.
3. Conductor piping from roof drains to storm building drain.
4. Storm building drain piping from conductor piping and area drains terminating at connection to storm sewers 5 feet outside foundation wall.
5. Domestic cold-water piping.
6. Domestic hot water piping.
7. Domestic circulating hot water piping.
8. Plumbing Fixtures: See Schedule on Drawings for types.
9. Specialty piping systems.
10. Condensate drain and water piping system for mechanical equipment.
11. Flashing and counterflashing of roof and wall penetrations required by installation of work of this Section.
12. Furnishing and installation of access doors required for work furnished by this Section.
13. Furnishing and installing of sleeves, inserts and anchorage required for the installation, which are embedded in work of other trades. Sleeve, wrap and seal piping in concrete.

#### B. Fixtures:

1. Plumbing fixtures and trim, including rims for sinks and lavatories in casework or counters, chair carriers (as required), drinking fountains, drains, cleanouts, floor sinks, and related fixtures shown on the Drawings.
2. Standards and supports for equipment requiring them.
3. Instructions and maintenance manuals for equipment furnished by this Section.

#### C. Water heaters.

#### D. Circulation pumps.

### 1.2 QUALITY ASSURANCE

#### A. Manufacturers: Firms regularly engaged in manufacture of plumbing system products, of types, materials, and sizes required.

#### B. Regulatory Requirements:

1. Codes: Comply with CEC pertaining to plumbing materials, construction and installation of products. Comply with local and state regulations.
2. ANSI Compliance: Comply with applicable American National Institute standards pertaining to products and installation.

# EXHIBIT C

## General Plumbing Systems

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3. PDI Compliance: Comply with applicable Plumbing and Drainage Institute standards pertaining to products and installation.
4. Federal Standards: Comply with applicable Federal Specification WW-P-541 Series sections pertaining to plumbing fixtures.
5. NAHB Label: Provide fiberglass bathtub units and shower stalls which have been tested and labeled by NAHB Research Foundation.
6. ADA Compliance: Construct and install barrier-free plumbing fixtures in accordance with "The Americans with Disabilities" Act.
7. UL and NEMA Compliance: Provide electric motors and electrical components required as part of plumbing equipment, which have been listed and labeled by UL and which comply with NEMA standards.
8. CEC Compliance: Comply with CEC as applicable to installation and electrical connections of ancillary electrical components of plumbing equipment.

### C. Water Heaters:

1. Water heaters to meet current energy efficiency code requirements. Refer to schedule on Drawings for capacity and model.

### D. Pumps:

1. UL Compliance: Design, manufacture and install in accordance with UL 778 "Motor-Operated Water Pumps."

## 1.3 SUBMITTALS

- A. Product data in accordance with Division 01, Administrative Requirements. Manufacturer's specifications, installation and startup instructions, capacity and ratings, with selection indicated. Provide pump performance curves with selection points indicated. Provide specialties and accessories required for a complete and operable installation.
- B. Shop Drawings: Provide assembly type shop drawings indicating dimensions, weights, required clearances, and methods of assembly of components and anchorages.
- C. Wiring Diagrams: Ladder type wiring diagrams for components, indicating required field electrical connections.
- D. Maintenance Data: Submit maintenance data and parts list for each item. Include "troubleshooting" maintenance guides. Include this data in operation and maintenance manual.

## 1.4 PLUMBING FIXTURES

- A. General: Provide factory-fabricated fixtures of type, style and material indicated on the plumbing fixture connection schedule on the Drawings. For each type fixture, provide fixture manufacturer's standard trim, carrier, seats, and valves as indicated by their published product information; either as designed and constructed, or as recommended by manufacturer, and as required for complete installation. Where more than one type is indicated, selection is installer's option; but, fixtures of same type must be furnished by a single manufacturer. Where type is not otherwise indicated, provide fixtures complying with governing regulations.
  1. Fixtures: Complete with fittings, supports, fastening devices, faucets, valves, traps, stops and appurtenances required.
  2. Escutcheons: Brass, chrome plated.
  3. Fixture Locations: As shown on Drawings.
  4. Stops: Stops installed in each supply pipe at each fixture accessibly located with wall escutcheons.
  5. Showers: Provide with flow control device to prevent flow over 2.5 GPM.

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## General Plumbing Systems

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6. Public Lavatories: Provide with flow control device to prevent flow over 0.5 GPM.

### PART 2 - PRODUCTS

#### 2.1 PRODUCTS

- A. See Plumbing Schedules.

### PART 3 - EXECUTION

#### 3.1 CHLORINATION

- A. General: Upon completion of tests and necessary replacements, thoroughly flush and disinfect domestic water piping.
- B. Method: After thoroughly flushing system with water to remove sediment, fill system with a solution containing 50 parts per million of chlorine for not less than 24 hours or 200 parts per million of chlorine for not less than 3 hours. After retention, drain, reflush and return system to service.
- C. Certification: Provide copy of domestic water chlorination certificate in each operations and maintenance manual.

#### 3.2 FIRESTOPPING PENETRATIONS IN FIRE-RATED WALL/FLOOR ASSEMBLIES

- A. Refer to Section 07 84 13.
- B. Provide proper sizing when providing sleeves or core-drilled holes to accommodate the penetration. Firestop voids between sleeve or core-drilled hole and pipe passing through to meet the requirements of ASTM E814.
- C. Manufacturers: Hilti, Proset, or approved.

#### 3.3 PROTECTION

- A. Protect fixtures and equipment from damage. Replace damaged items with new.
- B. Keep pipe openings closed by means of plugs or caps to prevent the entrance of foreign matter. Protect piping, ductwork, fixtures, equipment and apparatus against dirty water, chemical or mechanical damage both before and after installation. Restore to its original condition or replace fixtures, equipment or apparatus damaged prior to final acceptance of the work.
- C. Protect bright finished shafts, bearing housings and similar items, until in service; no rust will be permitted.
- D. Cover equipment and materials stored on the job site or otherwise suitably protect at the direction of, and to the satisfaction of Architect. If coverings become torn, replace until the equipment is connected and operating.

#### 3.4 PIPING SYSTEMS INSTALLATION

- A. Piping:
  1. General: Lay underground building drains beginning at low point of systems, true to grades and alignment indicated with unbroken continuity of invert. Place bell ends of piping facing upstream. Install required gaskets in accordance with manufacturer's recommendations for use of lubricants, cements, and other special installation requirements. Clean interior of piping of dirt and other superfluous materials as work progresses. Maintain swab or drag in line and pull past each joint as it is completed. Place plugs in ends of uncompleted piping

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## General Plumbing Systems

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- at end of day or whenever work stops. Coordinate installation of piping below with structural components and other system installations.
2. Install piping pitched to drain at minimum slope of 1/4 inch per foot (2 percent). Where this slope is impractical, slope at 1/4 inch per foot for pipes below 4-inch size, and 1/8 inch per foot (1 percent) for piping 4 inches and larger, with the approval of the local code authority.
  3. Condensate Drain Piping at HVAC Units: Trap condensate drain for HVAC units in accordance with Detail on Plumbing Drawings.
  4. Seismic Restraint: Brace mechanical piping and plumbing equipment against lateral movement as detailed in document "Seismic Restraint Manual Guidelines for Mechanical Systems" as published by SMACNA.
  5. Rough-in Piping: Provide temporary caps or plugs at piping shown on Drawings to be roughed-in for future connections by others.
  6. Sanitary Waste and Storm Drain Piping: Slope at uniform grade of 1/4 inch per foot unless noted otherwise. Make changes in size with reducing and wye fittings. Run exposed piping parallel or perpendicular to building structure.
  7. Sanitary Waste Piping from Back-to-Back Water Closets: Provide individual rough-in piping for each back-to-back water closet, no common sanitary cross, double fixture or double combination wye and 1/8 bend fittings allowed.
  8. Vent Piping:
    - a. General: Horizontal runs free of drops and sloped to drainage system.
    - b. Vents-Through-Roof (VTRs): Provide flashing with counterflashing at vent penetrations through roof, as detailed. Wherever vents run up near or inside of exterior walls, offset pipe at underside of roof deck to obtain minimum 5-foot clearance between parapet and roof penetration. Provide code required clearances between vent-through-roof and HVAC equipment on roof. VTR counterflashings to have a manufactured rolled return bend with minimum 1-inch overlap; crimping by hand tools will not be allowed. On single ply vinyl or plastic type roofs, provide flashings as required by roof installer and manufacturer. On raised rib steel roofs, provide flashings as required by roof installer and manufacturer.
- B. Cleanouts: Install in aboveground piping and building drain piping as indicated, as required by code; at each change in direction of piping greater than 135 degrees; at minimum intervals of 100 feet; and at base of each vertical soil or waste stack. Install floor and wall cleanout covers for concealed piping. Select type to match adjacent building finish. Coordinate locations and types of cleanouts with Architect prior to
- C. Flashing Flanges: Install flashing flange and clamping device with each stack and cleanout passing through waterproof membranes.
- D. Vent Flashing Sleeves: Install on stacks passing through roof, secure over stack flashing in accordance with manufacturer's instructions. Coordinate with roofing system.
- E. Equipment Connections:
1. Provide soil and waste piping runouts to plumbing fixtures and drains, with approved trap, of sizes indicated; but in no case smaller than required by code.
  2. Locate piping runouts as close as possible to bottom of floor slab supporting fixtures or drains.
  3. Piping Runouts to Fixtures: Provide hot and cold piping runouts to fixtures of sizes indicated, but in no case smaller than required by code.
  4. Equipment Connections: Connect hot and cold water piping system to equipment as indicated, and comply with equipment manufacturer's instructions. Provide shutoff valve and union for each connection; provide drain valve on drain connection.
- F. Domestic Water Distribution Piping:



# EXHIBIT C

## General Plumbing Systems

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1. Water Service Piping: Provide sleeve in foundation wall for water service entry; make entry watertight. Provide shutoff valve at water service entry inside building; pressure gauge, test tee with valve.
  2. Group piping installations and valves where possible to obtain maximum practical use of available space.
  3. Arrange locations of valves, unions, drains and other components to provide for ease of cleaning, operation, repair or service. Size access panels and locate to provide both acceptable proximity and working space for such devices.
  4. Provide protection plates for piping installed in wood stud walls and other building substructures as required by code.
  5. Wherever piping is installed in exterior walls, route on warm side of insulation and as close to inside wall finish as possible, as detailed.
  6. Provide low point drains and shutoff valves as required by local AHJ. Provide valve boxes, access panels, and the like, for complete installation.
- G. Valves:
1. Sectional Valves: Install on each branch and riser, close to main, where branch or riser serves two or more plumbing fixtures or equipment connections, and elsewhere as indicated.
  2. Shutoff Valves: Install on inlet of each plumbing equipment item, and on inlet of each plumbing fixture, and elsewhere as indicated.
  3. Drain Valves: Install on each plumbing equipment item located to completely drain equipment for service or repair. Install at base of each riser, at base of each rise or drop in piping system, and elsewhere where indicated or required to completely drain domestic water piping system.
  4. Check Valves: Install on discharge side of each pump, and elsewhere as indicated.
  5. Balancing Valves: Install in each hot water recirculating loop, and elsewhere as indicated.
- H. Backflow Preventers:
1. Install where indicated, and where required by code. Where practical, locate in same room as equipment being protected.
  2. Submit product cut sheets to local AHJ for approval prior to purchase.
  3. Install as close to wall as possible with clearances for access and maintenance as required by AHJ.
  4. Coordinate exact location of installation and type of backflow device serving a particular piece of equipment with AHJ and Architect prior to purchase and installation.
  5. Provide wall/floor brackets that are of fully welded, hot dipped galvanized construction, fabricated to meet field conditions. Mount backflow preventer to brackets using cadmium plated "U" type bolts and nuts.
  6. Contact: Contact local water district/backflow specialist and request backflow installation literature. Install backflow devices per CEC and local water district/backflow specialist requirements.
  7. Route waste piping from air gap waste fitting concealed within walls to point of air gap termination at indirect waste interceptor.
- I. Excavation and Backfill:
1. General: Perform necessary excavation and backfill required for installation of mechanical work. Repair piping or other work damaged by Contractor's operations.
  2. Water: Keep excavations free of standing water. Reexcavate and fill back excavations damaged or softened by water or frost to original level with sand, crushed rock or other approved material at no expense to Owner.

# EXHIBIT C

## General Plumbing Systems

3. Tests: During progress of work for compacted fill, Owner reserves right to request compaction tests made under direction of a testing laboratory.
4. Trench Excavation: Excavate trenches to necessary depth and width, removing rocks, unstable soil (muck, peat, and the like), roots and stumps. Excavation material is classified as "base fill" and "native." Base fill excavation material consisting of placed crushed rock may be used as backfill above "Pipe Zone." Remove and dispose off site native excavation material at no expense to Owner. Adequate width of trench for proper installation of piping or conduit.
5. Support Foundations:
  - a. Foundations: Excavate trenches located in unstable ground areas below elevation required for installation of piping to a depth which is determined by Architect as appropriate for conditions encountered. Place and compact approved foundation material in excavation up to "Bedding Zone." Dewatering, placement, compaction and disposal of excavated materials to conform to requirements contained in other sections of Specifications or drawings.
  - b. Over-Excavations: Where trench excavation exceeds required depths, provide, place and compact suitable bedding material to proper grade or elevation at no additional cost to Owner.
  - c. Foundation Material: Where native material has been removed, place and compact necessary foundation material to form a base for replacement of required thickness of bedding material.

	Class A		Class B	
Material Passing:	Min.	Max.	Min.	Max.
3/4-inch Square Opening	27	47	0	1

- d. Bedding Material: Full bed site piping on sand, pea gravel or 3/4-inch minus crushed rock. Place a minimum 4-inch deep layer of sand or crushed rock on leveled trench bottom for this purpose. Remove bedding to necessary depth for piping bells and couplings to maintain contact of pipe on bedding for its entire length. Provide additional bedding in excessively wet, unstable, or solid rock trench bottom conditions as required to provide a firm foundation.
6. Backfilling:
    - a. Following installation and successful completion of required tests, backfill piping in lifts.
      - 1) In "Pipe Zone," place backfill material and compact in lifts not to exceed 6 inches in depth to a height of 12 inches above top of pipe. Place backfill material to obtain contact with entire periphery of pipe, without disturbing or displacing pipe.
      - 2) Place and compact backfill above "Pipe Zone" in layers not to exceed 12 inches in depth.
    - b. Backfill Material:
      - 1) Backfill Material in "Pipe Zone": 3/4-inch minus crushed rock, sand or pea gravel.
      - 2) Crushed rock, fill sand or other backfill material approved elsewhere in Specifications may be used above "Pipe Zone."

# EXHIBIT C

## General Plumbing Systems

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7. Compaction of Trench Backfill:
  - a. Where compaction of trench backfill material is required, use one of following methods or combination thereof:
    - 1) Mechanical tamper,
    - 2) Vibratory compacter, or
    - 3) Other approved methods appropriate to conditions encountered.
  - b. Architect to have right to change methods and limits to better accommodate field conditions. Compaction sufficient to attain 95 percent of maximum density at optimum moisture content unless noted otherwise on Drawings or elsewhere in Specifications. Water "puddling" or "washing" is prohibited.
  
- J. Testing:
  1. General:
    - a. Provide temporary equipment for testing, including pumps, compressors, tanks, and gauges, as required. Test piping systems before insulation is installed and remove or disengage control devices before testing. Where necessary, test sections of each piping system independently, but do not use piping valves to isolate sections where test pressures exceed local valve operating pressure rating. Fill each section with water, compressed air, or nitrogen and pressurize for the indicated pressure and time.
    - b. Notify Architect and local Plumbing Inspector 2 days before tests.
    - c. Drainage, Waste and Vent Piping: Test in accordance with governing plumbing code or as follows: Test drainage and venting systems, with necessary openings plugged, to permit system to be filled with water and subjected to a water pressure of a minimum of 5-PSI head. System to hold water without a water level drop greater than 1/2 pipe diameter of largest nominal pipe size within a 24-hour period. Test system in sections if minimum head cannot be maintained in each section. The 5-PSI head to be the minimum pressure at the highest joint.
    - d. Water Piping: Eliminate air from system. Fill and test at 125 PSIG or minimum 1-1/2 times static pressure at connection to serving utility main for a period of two hours with no loss in pressure.
    - e. Send test results to Architect for review and approval.
  
  2. Testing of Pressurized Systems:
    - a. Test each pressurized piping system at 150 percent of operating pressure indicated, but not less than 125 PSIG test pressure.
    - b. Observe each test section for leakage at end of test period. Test fails if leakage is observed or if pressure drop exceeds 2 percent of test pressure.
    - c. Test hot and cold domestic water piping systems upon completion of rough in and before connection to fixtures at a hydrostatic pressure of 125 PSIG.
  
  3. Repair:
    - a. Repair piping system sections which fail the required piping test by disassembly and reinstallation, using new materials to the extent required to overcome leakage.

# EXHIBIT C

## General Plumbing Systems

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Do not use chemicals, stop-leak compounds, mastics, or other temporary repair methods.

- b. Drain or purge test water, air, or nitrogen from piping system after testing and repair work have been completed.

- K. Water Hammer Arrestors (Shock Absorbers): Locate shock absorbers in supply pipe in accordance with recommendations of Plumbing and Drainage Institute PDI-WH201. Install ahead of solenoid operated valves. Determine size of absorber by fixture unit value of fixture supplied, using PDI symbols to designate sizes. Provide access panel for each shock absorber.

### 3.5 FIXTURES INSTALLATION

#### A. General:

1. Install plumbing fixtures of types indicated where shown and at indicated heights; in accordance with fixture manufacturer's written instructions, roughing-in drawings, and with recognized industry practices. Ensure that plumbing fixtures comply with requirements and serve intended purposes.
2. Verification of Conditions: Examine roughing-in work of potable water and waste piping systems to verify actual locations of piping connections prior to installing fixtures. Examine floors and substrates, and conditions under which fixture work is to be accomplished. Correct incorrect locations of piping and other unsatisfactory conditions for installation of plumbing fixtures.
3. Set and connect to soil, waste, vent and water piping in neat, finished and uniform manner. Connections to be equal height, plumb and set at right angles to floor, wall or both unless otherwise required or specified.
4. Seal fixtures mounted on floors and walls at abutting joints with approved sealant compounds as directed by Architect.
5. For ADA accessible toilets, provide with handle at wide portion of stall.
6. Lavatories: Set mixing valves to limit outlet temperature to 110F.

- B. Fixture Locations: As shown on Drawings. Center water closets and urinals between privacy partitions unless noted otherwise.

- C. Stops: Stops installed in each supply pipe at each fixture accessibly located with stops of loose key type. Concealed stops to be screwdriver or loose key type with wall escutcheons.

#### D. Fixture Supports:

1. Support wall hung lavatories on heavy duty, full size, and concealed, commercial grade chair carriers mounted to floor structure. Refer to plumbing fixture connection schedule on drawings.
2. Support other fixtures mounted on stud partitions on heavy concealed wall brackets bolted to a 1/4-inch thick by 5-inch high steel plate anchored firmly to studs with bolts (or welded to metal studs). Plate to extend one stud each way beyond fixture mounting point width.

- E. Flush Valves: Provide "drop-ear" ells or couplings in wall at water supply outlets to flush valves; anchor firmly to structure. At ADA accessible fixtures, face handle to wide portion of stall.

- F. After fixtures are set in place and secured to walls, caulk around between fixtures and wall with white silicone caulking compound. Dow Corning 780, General Electric Construction Sealant, or approved.

- G. Set countertop lavatories and stainless steel sink rims in waterproof sealant made for application.

- H. Adjust self-closing faucets to provide minimum of 10 seconds of waterflow, and maximum of 15 seconds.

- I. After fixture installation is complete, cover and protect rims, fronts and exposed parts until completion of construction phase. Contractor to be responsible for damage to fixtures and assumes related fixture repair or replacement costs.

# EXHIBIT C

## General Plumbing Systems

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- J. Adjusting and Cleaning: Clean plumbing fixtures, trim, and strainers of dirt and debris upon completion of installation. Adjust water pressure at drinking fountains, faucets, shower valves and flush valves to provide proper flow stream and specified GPM. Repair leaks at faucets and stops.
- K. Extra Stock: Furnish special wrenches and other devices necessary for servicing plumbing fixtures and trim to Owner.
- L. Field Quality Control:
  - 1. Upon completion of installation of plumbing fixtures and after units are water pressurized, test fixtures to demonstrate capability and compliance with requirements. When possible, correct malfunctioning units at site, then retest to demonstrate compliance; otherwise, remove and replace with new units and proceed with retesting.
  - 2. Inspect each installed unit for damage to finish. If feasible, restore and match finish to original at site; otherwise, remove fixture and replace with new unit. Feasibility and match to be judged by Architect. Remove cracked or dented units and replace with new units.
- M. Adjusting and Cleaning: Clean piping exterior surfaces. Comply with Section 22 07 00, Plumbing Insulation, as applicable. Flush out water filled or drainage piping systems with clean water.
- N. Hose Bibb Piping: Provide each hose bibb with an individual accessible shutoff valve (ball type). Locate where shown on Drawings. Provide full access.

END OF SECTION 22 05 00

# EXHIBIT C

Plumbing Systems Insulation

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## PLUMBING SYSTEMS INSULATION

SECTION 22 07 00

### PART 1 - GENERAL

#### 1.1 SUMMARY

- A. Piping and Equipment Insulation: Materials and installation of insulation, jackets and accessories for the following applications:
  - 1. Hot and cold domestic water piping systems.
  - 2. Condensate piping systems.
  - 3. ADA accessible lavatory/sink P-trap and supplies/stops.

#### 1.2 QUALITY ASSURANCE

- A. Qualification of Workers: Use proficient journeyman insulators and supervisors in the execution of this portion of the work to ensure proper and adequate installation of insulation throughout. A firm with at least 5 years successful installation experience on projects with installations similar to that required for this project.
- B. Compliance with Specifications:
  - 1. Whenever required during progress of the work, furnish proof acceptable to the Owner that items installed are equal to or exceed requirements specified for this work.
  - 2. In the event such proof is not available, or is not acceptable to the Owner, the Owner may require the Contractor to remove the item or items and replace with material meeting the specified requirements and to repair damage caused in the removal and replacement, at no additional cost to the Owner.
  - 3. Install per manufacturer's written instructions.
  - 4. As a minimum, comply with appropriate state energy code or other applicable codes.

#### 1.3 SUBMITTALS

- A. Product Data: Submit manufacturer's technical data and installation instructions for each type of insulation, jacket, glue, paint, fitting cover, and accessory. Submit schedule showing manufacturer's product number, thickness, and furnished accessories for each piping, equipment and duct system requiring insulation.

#### 1.4 PRODUCT HANDLING

- A. Protection: Use means necessary to protect insulation materials before, during and after installation.

# EXHIBIT C

## Plumbing Systems Insulation

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- B. Replacements: In the event of damage, immediately make repairs and replacements necessary.

### 1.5 FIRE HAZARD CLASSIFICATION

- A. Maximum fire hazard classification of the composite insulation construction as installed to be not more than a flame spread of 25, fuel contributed of 50 and smoke developed of 50 as tested by ASTM E84 (NFPA 255) method.
- B. Test pipe insulation in accordance with the requirements of UL "Pipe and Equipment Coverings R5583 400 8.15."
- C. Test duct insulation in accordance with ASTM E84 and bear the UL label.

## PART 2 - PRODUCTS

### 2.1 MANUFACTURERS

- A. Piping: Armacell LLC Armaflex, Certainteed, Imcoa, Johns Manville, Knauf, Nomaco, Owens-Corning, PPG, or approved.

### 2.2 TYPE 7, ADA ACCESSIBLE LAVATORY/SINK INSULATION KIT

- A. P-traps, hot water and cold water insulating guards. Molded closed cell vinyl with nylon fasteners, paintable. Thermal conductivity;  $K = 1.17 \text{ (BTU/in) / (hr/sq.ft./deg. F)}$  at 75F mean temperature. Provide accessories as required for complete installation. Color white. Truebro Inc. Model 102. McGuire, ProWrap, Brocar Trap Wrap, or approved.

### 2.3 ACCESSORIES

- A. Equipment Insulation Jacketing: Presized glass cloth, not less than 7.8 ounces/sq.yd., except as otherwise indicated. Coat with gypsum based cement.
- B. Equipment Insulation Compounds: Provide adhesives, cement, sealers, mastics and protective finishes as recommended by insulation manufacturer for applications indicated.
- C. General: Provide staples, bands, wire, wire netting, tape corner angles, anchors, stud pins and metal covers as recommended by insulation manufacturer for applications indicated. Accessories, i.e., adhesives, mastics, cements and tape to have the same flame and smoke component ratings as the insulation materials with which they are used. Shipping cartons to bear a label indicating that flame and smoke ratings do not exceed those listed above. Provide permanent treatment of jackets or facings to impart flame and smoke safety. Provide nonwater soluble treatments.

## PART 3 - EXECUTION

### 3.1 VERIFICATION OF CONDITIONS

- A. Do not apply insulation until pressure testing of the ducts has been completed. Do not apply insulation until the duct has been inspected.
- B. Examine areas and conditions under which duct insulation will be installed. Do not proceed with work until unsatisfactory conditions have been corrected.

# EXHIBIT C

## Plumbing Systems Insulation

### 3.2 PREPARATION

- A. Clean and dry surfaces to be insulated.

### 3.3 INSTALLATION

- A. Insulation: Continuous through walls, floors, partitions except where noted otherwise.
- B. Piping and Equipment:
  - 1. Install insulation over clean, dry surfaces with adjoining sections firmly butted together and covering surfaces. Fill voids and holes. Seal raw edges. Install insulation in a manner such that the insulation may be split, removed, and reinstalled with vapor barrier tape on strainer caps and unions. Do not install insulation until the piping has been leak tested and has passed such tests. Do not insulate chiller manholes, equipment manufacturer's nameplates, handholes, and ASME stamps. Provide beveled edge at such insulation interruptions. Repair voids or tears.
  - 2. Cover insulation on pipes above ground, outside of buildings, with aluminum jacketing. Position seam on bottom of pipe.

### 3.4 PROTECTION AND REPLACEMENT

- A. Protect installed insulation during construction. Replace damaged insulation which cannot be repaired satisfactorily, including units with vapor barrier damage and moisture saturated units.

### 3.5 LABELING AND MARKING

- A. Provide labels, arrows and color coding on piping per Section 22 05 53, Identification for Plumbing Piping and Equipment. Attach labels and arrows to the jacketing.

### 3.6 PIPING SURFACES TO BE INSULATED

Item to be Insulated:		Pipe Size:	Insulation Thickness:
Domestic hot water and hot water circulation piping above grade.		Runouts up to 2-inches Mains = <2 inches Mains >2 inches	1 inch 1 inch 1-1/2 inches
Domestic water piping exposed to weather.		All	1-1/2 inches
ADA accessible lavatory/sink.		All	as listed

Note: Insulation thickness shown is a minimum. If state codes or AHJ require additional thickness, provide insulation thickness per code and AHJ requirements.

### 3.7 ADA ACCESSIBLE LAVATORIES/SINKS

- A. Install lavatory/sink insulation kit.



# EXHIBIT C

## Plumbing Systems Insulation

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### 3.8 INSULATED PIPE EXPOSED TO WEATHER

- A. Where piping is exposed on roof, cover insulation with aluminum jacket. Seal watertight jacket per manufacturer's recommendations. Provide heat tracing on piping subject to freezing.

### 3.9 INSULATION SHIELDS

- A. Provide full size diameter hangers and shields (18 gauge minimum) for cold piping. Hot water piping hangers may penetrate insulation to contact pipe directly. Provide 18-inch long, noncompressible insulation section at insulation shields for lines 2 inches and larger (steam and cold piping).

### 3.10 FOAMED PLASTIC EQUIPMENT INSULATION

- A. Apply insulation and accessories to roof drain/overflow underbodies per manufacturer's recommendations.

END OF SECTION 22 07 00

# EXHIBIT C

Heating, Ventilating and Air Conditioning (HVAC)

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## HEATING, VENTILATING AND AIR CONDITIONING (HVAC)

SECTION 23 05 00

### PART 1 - GENERAL

#### 1.1 SUMMARY

- A. Work includes but is not limited to the following major items:
  - 1. Air distribution, heating, cooling, ventilation and exhaust systems.
  - 2. Equipment used for distribution of air, including fans, motors, controls, control wiring, filters, ductwork, air supply outlets, air return and exhaust inlets.
  - 3. Sleeves, hangers, flashings, counterflashing and weatherproofing for mechanical equipment.
- B. Installation and startup instructions.

#### 1.2 QUALITY ASSURANCE

- A. Qualifications: Firms regularly engaged in the manufacture of HVAC equipment, of the types and capacities required.
- B. Regulatory Requirements; UL and CSA Compliance: Provide units which are UL and CSA listed.
- C. Unless otherwise noted, where the Specification refers to SMACNA in reference to sheet metal or flexible ductwork accessories, this refers to HVAC Duct Construction Standards, Metal and Flexible, latest edition, as published by SMACNA .
- D. Unless otherwise noted, where the Specification refers to SMACNA in reference to fibrous glass ductwork accessories, this refers to Fibrous Glass Duct Construction Standard.
- E. Regulatory Requirements - Packaged Air Conditioning Units:
  - 1. ARI 210/240-2003: Unitary Air-Conditioning and Air-Source Heat Pump Equipment.
  - 2. ARI 270-95: Sound Rating of Outdoor Unitary Equipment.
  - 3. NRCA: Provide roof curbs in accordance with NRCA.

#### 1.3 SUBMITTALS

- A. Product Data: Submit manufacturer's technical product data, including rated capacities of selected model clearly indicated, weights (shipping, installed and operating), furnished specialties and accessories, and installation and start-up instructions.
- B. Shop Drawings: Submit manufacturer's assembly type shop drawings indicating dimensions, weight loadings, required clearances, methods of assembly of components, location and size of each field connection, arrangement and construction including bussing, and number and type of contactors employed. Submit manufacturer's catalog data on sealer, flexible ducting, vent piping, factory fabricated devices, and factory fabricated duct and fittings.
- C. Wiring Diagrams: Submit manufacturer's electrical requirements for power supply to HVAC equipment. Submit manufacturer's ladder type wiring diagrams for interlock and control wiring. Clearly differentiate between portions of wiring that are factory installed and portions to be field installed.

# EXHIBIT C

## Heating, Ventilating and Air Conditioning (HVAC)

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- D. Maintenance Data: Submit maintenance data and parts list for equipment including control, accessory, and "troubleshooting" maintenance guide. Include this data and product data in maintenance manual.
- E. Equipment Start-Up Procedures: Submit equipment start-up procedures for HVAC systems for each piece of equipment. Include completed Start-up Documentation as filled out by the field technician and include this data in the Operations & Maintenance manual.
- F. For equipment that is roof mounted or hung from structure, equipment manufacturer to provide, as a shop drawing submittal, details, devices, and the like, required for appropriate equipment mounting. Details and drawings to be stamped by a registered structural engineer in the state of California.
- G. Record Drawings: At project closeout, submit Record Drawings of installed ductwork, duct accessories, and outlets and inlets.

### 1.4 AIR DISTRIBUTION DUCT SYSTEM

- A. General: Provide ductwork, including collars, register boxes, fire dampers, exhaust fans, ventilation louvers, roof vents and screens, as well as dampers and other miscellaneous items not specifically mentioned but necessary for a complete installation. Apply the latest standards of SMACNA and ASHRAE with respect to sheet- metal gauge and general construction for round and rectangular ducts.

### 1.5 DELIVERY, STORAGE AND HANDLING

- A. Comply with manufacturer's rigging and installation instructions for unloading and installing HVAC equipment.
- B. Protect accessories from damage during shipping, storage and handling.

### 1.6 GUARANTY

- A. General: Provide written guaranty on HVAC work, agreeing to replace/repair inadequate and defective materials and quality of work, including leakage, breakage, improper assembly and failure to perform as required for a period of 1 year from date of Owner's acceptance. Include separate product warranties as indicated for specific parts or products in the work. Provide guaranty signed by both the installer and Contractor.
- B. Include manufacturer's standard product warranty, covering HVAC equipment operation under normal conditions and use, where installed, operated and maintained in accordance with manufacturer's instructions. Provide product warranty period terminating 12 months after final acceptance, by Owner, of the project.

## PART 2 - EXECUTION

### 2.1 INSPECTION

- A. Examine areas and conditions under which HVAC equipment is to be installed. Do not proceed with work until unsatisfactory conditions have been corrected.

### 2.2 VERIFICATION OF CONDITIONS

- A. Examine areas and conditions under which equipment and air terminals are to be installed. Do not proceed with work until unsatisfactory conditions have been corrected.

### 2.3 VIBRATION AND ISOLATION APPLICATION

- A. General:

# EXHIBIT C

## Heating, Ventilating and Air Conditioning (HVAC)

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1. Install flexible duct connections at fan unit intakes, fan unit discharges, and wherever else shown on Drawings.
- B. Drain Service Piping Connected to Vibration Isolated Equipment: Do not contact the building structure or other nonisolated system unless it is resiliently mounted.

### 2.4 DUCTWORK INSTALLATION

- A. Install ductwork in strict conformance with SMACNA standards and comply with CMC requirements.
- B. Erect ductwork true to dimensions indicated, straight and smooth on inside with neatly finished joints lapped in direction of air travel. Properly brace and reinforce ducts with steel angles or members.
- C. Elbows: Standard centerline radius to equal 1-1/2 times width of duct.
- D. Install single thickness turning vanes in square throat rectangular elbows and in tees. Provide 3/4-inch trailing edge on turning vanes, turned slightly past parallel to the duct.
- E. Duct sizes shown on Drawings are net inside dimensions.
- F. Locate access doors in ductwork as required for service of fire dampers, automatic dampers and other items requiring maintenance or inspection.
- G. Duct Hangers and Supports:
1. Hang rectangular sheet-metal ducts with a cross sectional area of less than 7 sq.ft. with galvanized strips of No. 16 USS gauge steel 1 inch wide, and larger ducts with steel angles and adjustable hanger rods similar to piping hangers. Support at 8 feet on center, as detailed.
  2. Anchor ducts securely to building in such a manner as to prevent transmission of vibration to structure. Do not connect duct hanger straps to roof deck. Do not support ducts from other ducts or piping.
  3. For round sheet-metal ducts, provide duct support in accordance with SMACNA Guidelines. Verify type of building construction.
  4. Attach straphangers installed flush with end of sheet-metal duct run to duct with sheet-metal screws.
- H. Seismic Restraint: Brace ductwork and HVAC equipment against lateral movement as detailed in document "Seismic Restraint Manual Guidelines for Mechanical Systems" as published by SMACNA.
- I. Limitations: Do not run ductwork within confines of electrical rooms, elevator shafts or elevator equipment rooms except those ducts specifically serving only such rooms.
- J. Duct Access Doors:
1. Install where shown and required by SMACNA. Provide on the reset side of fire dampers and adjacent to duct mounted automatic dampers. Install per manufacturer's recommendations.
  2. Where access doors are for service of fire or smoke dampers, stencil the words "Fire Damper" or "Smoke Damper" in 1/2-inch-high capital letters on the outside of the door.
- K. Fire Dampers:
1. Install in accordance with SMACNA, the manufacturer's recommendations, UL 555, and NFPA 90A.
  2. Install where indicated on the Drawings.
- L. Fire/Smoke Dampers and Smoke Dampers:
1. Install dampers per manufacturer's instructions.

# EXHIBIT C

## Heating, Ventilating and Air Conditioning (HVAC)

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2. If damper is installed within a duct, provide smoke detector within 5 feet of damper with no air inlets or outlets between the damper and detector. Detector to be listed for air velocity, temperature and humidity anticipated at point of installation.
3. [Provide control wiring, transformers and power connections for an operable damper and detection system.
4. Coordinate multiple motor connectors with electrical.

### M. Air Outlets and Inlets:

1. Install grilles, registers, and diffusers per manufacturer's instructions. Locate and size openings through finished surfaces to provide complete coverage of rough openings by integral device flanges or auxiliary frames.
2. Paint exterior of devices per color selected by Architect.
3. Coordinate duct connections with device final dimensions. Provide square to round adapters where required for connection to round ducts.
4. Adjust the throws of air outlets to eliminate drafts.

## 2.5 EQUIPMENT INSTALLATION

### A. Equipment:

1. General: Install in accordance with manufacturer's installation instructions, plumb and level, firmly anchored to vibration isolators. Maintain manufacturer's recommended clearances.
2. Controls: Furnish field installed automatic temperature control requirements as indicated.
3. Manufacturer's Supervision: Equipment manufacturer supervises field assembly and installation of equipment work, with factory trained technical service representative. Prepare manufacturer's written report of installation and testing, signed by representative.
4. Start up equipment in accordance with manufacturer's start-up instructions, and in presence of manufacturer's representative. Test controls and demonstrate compliance with requirements. Replace damaged or malfunctioning controls and equipment.
  - a. Do not place equipment in sustained operation prior to initial balancing of mechanical systems.

## 2.6 TRAINING OF OWNER'S PERSONNEL

- A. Provide services of manufacturer's technical representative for 8 hours to instruct Owner's personnel in operation and maintenance of equipment provided under this Section. Schedule training with Owner; provide at least a 7-day notice to Owner and Architect of training date.

## 2.7 CLEANING

- A. Clean exposed factory finished surfaces.

END OF SECTION 23 0500

# EXHIBIT C

Testing, Adjusting and Balancing

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## TESTING, ADJUSTING AND BALANCING

SECTION 23 05 93

### PART 1 - GENERAL

#### 1.1 SUMMARY

- A. Work Included: Materials, equipment and labor required for testing, adjusting, and balancing work required by this Section, including air, and associated equipment and apparatus. The work consists of setting speed and volume (flow) adjustments, recording data, conducting tests, preparing and submitting reports, and recommending modifications to work as required.

#### 1.2 SCOPE OF WORK

- A. Testing, adjusting, and Balancing (TAB) of the air conditioning systems and related ancillary equipment will be performed by a certified third party independent of the Contractor who specializes in testing, adjusting, and balancing of heating, ventilating, air-moving equipment and hydronic systems and has a minimum of 5 years experience in this specialty.
- B. Make changes or replacements to the sheaves, belts, dampers, valves, etc. required for the correct balance as advised the TAB Firm, at no additional cost to the Owner.
- C. Complete TAB services prior to Owner occupancy.

#### 1.3 QUALIFICATIONS

- A. Perform work of this Section by a firm certified by National Environmental Balancing Bureau (NEBB) or Associated Air Balance Council (AABC).
- B. Do work of this Section under the direct supervision of a person who has passed written and practical NEBB or AABC examinations for testing, adjusting, and balancing of air and hydronic systems.

#### 1.4 QUALITY ASSURANCE

- A. Codes and Standards:
  - 1. NEBB Compliance: Comply with NEBB's "Procedural Standards for Testing, Adjusting, and Balancing of Environmental Systems" as applicable to mechanical air and hydronic distribution systems, and associated equipment and apparatus; or comply with AABC's Manual MN-1, "AABC National Standards," as applicable to mechanical air and hydronic distribution systems, and associated equipment and apparatus.
  - 2. Industry Standards: Comply with ASHRAE recommendations pertaining to measurements, instruments, and testing, adjusting and balancing, except as otherwise indicated.
- B. Personnel: TAB personnel used on the project will be employees of the Test and Balance Agency. Perform TAB work under the direct supervision of the NEBB or AABC Certified Test and Balance Supervisor.
- C. Instrumentation:
  - 1. List in balance report instrument description, serial number, and date of calibration.
  - 2. Use instruments calibrated no longer than 1 year prior to report submission.

# EXHIBIT C

## Testing, Adjusting and Balancing

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### 1.5 SUBMITTALS

- A. Procedures: Submit certified test reports, signed by TAB supervisor who performed TAB work.
- B. Qualification Statements: Submit company's certification documents including Contractor Certification and Supervisor certification.
- C. Report Forms:
  - 1. Submit copies of report forms to Architect within 30 days of award of the Contract by Owner prior to commencement of testing and balancing work at the site.
  - 2. Provide 8-1/2- by 11-inch paper for loose-leaf binding, with blanks for listing the required test ratings and for certification of report.
  - 3. Submit reports on forms similar in content to standard AABC or NEBB test forms.
  - 4. Submit final test and balance report. Include Record Drawings with terminal codes for cross-reference with the Submittal, such that terminals referenced in the Submittal are easily located on the Drawings.
  - 5. Include identification and types of instruments used, and their most recent calibration date.
  - 6. Submit resume data on person who is to directly supervise testing, adjusting and balancing work.
- D. Maintenance Data: Include copies of balancing report and identification of instruments in maintenance manuals.
- E. NEBB or AABC Certificate: At time of submittal of forms, submit NEBB or AABC certification form for review.

### 1.6 WARRANTY

- A. TAB Agency provides warranty for a period of 90 days following submission of completed report, during which time, Owner may request a recheck of up to 10 percent of total number of terminals, or resetting of outlet, coil, or device listed in the final TAB report.
- B. Warranty meets the requirements of the following programs:
  - 1. AABC – National Project Performance Guarantee
  - 2. NEBB – Conformance Certification

## PART 2 - PRODUCTS

### 2.1 PATCHING MATERIALS

- A. Ductwork and Housings: Use plastic plugs with retainers to patch drilled holes.

### 2.2 INSTRUMENTS

- A. Utilize test instruments and equipment as recommended in the following:
  - 1. NEBB's Procedural Standards for Testing, Adjusting and Balancing of Environmental Systems.
  - 2. AABC's Manual MN-1, "AABC National Standards."

# EXHIBIT C

## Testing, Adjusting and Balancing

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### PART 3 - EXECUTION

#### 3.1 AIR SYSTEM PROCEDURE

- A. Adjust air handling and distribution systems to provide required or design supply, return, outside, and exhaust air quantities.
- B. Measure air quantities at air inlets and outlets. Log shows each successive test.

#### 3.2 AIR MOVING EQUIPMENT TESTING

- A. Location.
- B. Manufacturer.
- C. Model.
- D. Supply airflow, specified and actual.
- E. Return airflow, specified and actual.
- F. Outside airflow, specified and actual.
- G. Total external static pressure, specified and actual.
- H. Inlet pressure.
- I. Discharge pressure.
- J. Fan RPM.

#### 3.3 EXHAUST FAN TESTING

- A. Location
- B. Manufacturer.
- C. Model.
- D. Airflow, specified and actual.
- E. Total external static pressure, specified and actual.
- F. Inlet pressure.
- G. Discharge pressure.
- H. Fan RPM.

#### 3.4 RETURN AIR/OUTSIDE AIR TESTING

- A. Identification/location.
- B. Design airflow.
- C. Actual airflow.
- D. Design return airflow.
- E. Actual return airflow.
- F. Design outside airflow.
- G. Actual outside airflow.
- H. Return air temperature.
- I. Outside air temperature.
- J. Required mixed air temperature.
- K. Actual mixed air temperature.
- L. Design outside/return air ratio.
- M. Actual outside/return air ratio.

#### 3.5 ELECTRIC MOTORS TESTING

- A. Manufacturer.
- B. HP/BHP.
- C. Phase, voltage, amperage; nameplate, actual, no load. Record voltage and amperage on phases of 3 phase motors.



# EXHIBIT C

## Testing, Adjusting and Balancing

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- D. RPM.
- E. Service factor.
- F. Starter size, rating, heater elements.

### 3.6 AIR DISTRIBUTION TESTING

- A. Air terminal number.
- B. Room number/location.
- C. Terminal type.
- D. Terminal size.
- E. Design velocity.
- F. Design airflow.
- G. Test (final) velocity.
- H. Test (final) airflow.
- I. Percent of design airflow.
- J. Maximum actual airflow.
- K. Inlet static pressure.
- L. Inlet and outlet temperature with heating valve open.
- M. Coil water pressure drop, inlet and outlet temperatures and flowrate.
- N. Electric Heater Coil Data: KW, voltage, phase.
- O. Fan airflow for fan-powered terminal units.

END OF SECTION 23 05 93

# EXHIBIT C

## HVAC Insulation

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# HVAC INSULATION

## SECTION 23 07 00

### PART 1 - GENERAL

#### 1.1 SUMMARY

- A. Ductwork Insulation: Materials and installation of duct insulation including the following applications:
  - 1. Air conditioning and heating ductwork.
  - 2. Equipment related to air handling systems.

#### 1.2 SUBMITTALS

- A. Product Data: Submit manufacturer's technical data and installation instructions for each type of insulation, jacket, glue, paint, fitting cover, and accessory. Submit schedule showing manufacturer's product number, thickness, and furnished accessories for each piping, equipment and duct system requiring insulation.

#### 1.3 PRODUCT HANDLING

- A. Protection: Use means necessary to protect insulation materials before, during and after installation.
- B. Replacements: In the event of damage, immediately make repairs and replacements necessary.

#### 1.4 LINING MATERIALS

- A. Materials to be mold-, humidity-, and erosion-resistant surface that meets the requirements of UL 181.

### PART 2 - PRODUCTS

#### 2.1 MANUFACTURERS

- A. Ductwork: Armacell LLC Armaflex, Certainteed, Johns Manville, Knauf, Owens-Corning, PPG, or approved.

#### 2.2 TYPE 2, FLEXIBLE ELASTOMERIC INSULATION

- A. Elastomeric Foam: ASTM C534; flexible, cellular elastomeric, molded or sheet.
  - 1. Thermal Conductivity Value: 0.27 at 75F.
  - 2. Maximum Service Temperature of 220F.
  - 3. Maximum Flame Spread: 25.
  - 4. Maximum Smoke Developed: 50 (1 inch thick and below).
  - 5. Connection: Waterproof vapor retarder adhesive as needed.
  - 6. UV Protection: UV outdoor protective coating as needed.
- B. Glue Used in Cementing Rubber Insulation: Contact adhesive specifically manufactured for cementing flexible elastomeric foam. Armacell LLC Armaflex 520 adhesive, or Halstead.

# EXHIBIT C

## HVAC Insulation

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- C. Paint Used to Cover Rubber Insulation: Nonhardening high elasticity type, specifically manufactured as a protective covering of flexible elastomeric foam insulation for the prevention of degradation due to exposure to sunlight and weather. Armacell LLC Armaflex, or Halstead.

### 2.3 TYPE 7, FLEXIBLE FIBERGLASS BLANKET

- A. ASTM C553, Type 1, Class B-2; flexible blanket.
- B. 'K' Value: 0.27 at 75F installed.
- C. Density: 0.75 lb./cu.ft.
- D. Vapor Barrier Jacket: FSK aluminum foil reinforced with fiberglass yarn and laminated to fire resistant Kraft, secured with UL listed pressure sensitive tape or outward clinched expanded staples and vapor barrier mastic as needed.

### 2.4 TYPE 8, DUCT LINER

- A. ASTM C1071; flexible blanket.
- B. 'K' Value: ASTM C518, 0.25 at 75F.
- C. Noise Reduction Coefficient: 0.65 or higher based on "Type A mounting."
- D. Maximum Velocity on Mat or Coated Air Side: 5,000 FPM
- E. Adhesive: UL listed waterproof type.
- F. Fasteners: Duct liner galvanized steel pins, welded or mechanically fastened.
- G. Mold-, Humidity-, and Erosion-Resistant Surfaces: UL 181.

### 2.5 DUCT INSULATION ACCESSORIES

- A. Staples, bands, wires, tape, anchors, corner angles and similar accessories as recommended by insulation manufacturer for applications indicated.

### 2.6 DUCT INSULATION COMPOUNDS

- A. Cements, adhesives, coatings, sealers, protective finishes and similar accessories as recommended by insulation manufacturer for applications indicated.

## PART 3 - EXECUTION

### 3.1 VERIFICATION OF CONDITIONS

- A. Do not apply insulation until pressure testing of the ducts has been completed. Do not apply insulation until the duct has been inspected.
- B. Examine areas and conditions under which duct insulation will be installed. Do not proceed with work until unsatisfactory conditions have been corrected.

### 3.2 PREPARATION

- A. Clean and dry surfaces to be insulated.

### 3.3 INSTALLATION

- A. Insulation: Continuous through walls, floors, partitions except where noted otherwise.
- B. Ductwork:
  - 1. Install insulation in conformance with the manufacturer's recommendations to completely cover the duct.
  - 2. Butt insulation joints firmly together and install jackets and tapes smoothly and securely.

# EXHIBIT C

## HVAC Insulation

3. Apply duct insulation continuously through sleeves and prepared openings, except as otherwise specified. Apply vapor barrier materials to form a complete unbroken vapor seal over the insulation.
4. Coat staples and seals with vapor barrier coating.
5. Cover breaks in the jacket material with patches of the same material as the vapor barrier. Extend the patches not less than 2 inches beyond the break or penetration in all directions and secure with adhesive and staples. Seal staples and joints with brush coat of vapor barrier coating.
6. Fill jacket penetrations, i.e., hangers, thermometers and damper operating rods, and other voids in the insulation with vapor barrier coating. Seal the penetration with a brush coat of vapor barrier coating.
7. Seal and flash insulation terminations and pin punctures with a reinforced vapor barrier coating.
8. Continue insulation at fire dampers up to and including those portions of the fire damper frame which are visible at the outside of the rated fire barrier. Insulation terminations at fire dampers in accordance with the above.
9. Do not conceal duct access doors with insulation. Install insulation terminations at access doors in accordance with the above.
10. Duct Liners: Install mat finish surface on air stream side. Secure insulation to cleaned sheet metal duct with a continuous 100 percent coat of adhesive. For widths over 20 inches, additionally secure the liner with mechanical fasteners 15 inches on center. Accurately cut liner and thoroughly coat ends with adhesive. Butt joints tightly. Top and bottom sections of insulation overlap sides. Keep duct liner clean and free from dust. At completion of project, vacuum duct liner if it is dirty or dusty. Cut studs off near washers. Do not use small pieces. If insulation is installed without horizontal, longitudinal, and end joints butted together, installation will be rejected and work removed and replaced with work that conforms to this Specification.
11. Duct Wrap: Cover supply air ducts except ducts internally lined. Wrap tightly with circumferential joints butted and longitudinal joints overlapped minimum of 2 inches. Adhere insulation with 4-inch strips of insulating bending adhesive at 8 inches on center. On ducts over 24 inches wide, additionally secure insulation with suitable mechanical fasteners at 18 inches on center. Circumferential and longitudinal joints stapled with flare staples 6 inches on center and covered with 3-inch-wide, foil reinforced tape.

### 3.4 PROTECTION AND REPLACEMENT

- A. Protect installed insulation during construction. Replace damaged insulation which cannot be repaired satisfactorily, including units with vapor barrier damage and moisture saturated units.

Note: Insulation thickness shown is a minimum. If state codes require additional thickness, then provide insulation thickness per code requirements.

### 3.5 DUCTWORK SURFACES TO BE INSULATED

Item to be Insulated:	System Insulation Type:	Duct Size:	Insulation Thickness:
Supply and return ductwork (where duct is not specified to be lined or where ductboard is not utilized).	7, 8	all	1-1/2 inches

# EXHIBIT C

## HVAC Insulation

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Note: Insulation thickness shown is a minimum. If state codes require additional thickness, then provide insulation thickness per code requirements.

END OF SECTION 23 07 00

# EXHIBIT C

## Ductwork

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# DUCTWORK

## SECTION 23 31 00

### PART 1 - GENERAL

#### 1.1 SUMMARY

- A. Materials, installation and testing of HVAC ductwork and accessories, including the following:
  - 1. Heating and air conditioning supply and return systems.
  - 2. Outside air systems.
  - 3. Exhaust systems.
  - 4. Ductwork hangers.
  - 5. Plenums.
  - 6. Flues

#### 1.2 QUALITY ASSURANCE

- A. Unless otherwise noted, where the Specification refers to SMACNA in reference to sheet metal or flexible ductwork, this refers to HVAC Duct Construction Standards, Metal and Flexible, latest edition, as published by SMACNA.
- B. Unless otherwise noted, where the Specification refers to TIMA in reference to fiberglass ductwork, this refers to Fibrous Glass Duct Construction Standards, latest edition, as published by TIMA.
- C. Provide duct systems per CMC, latest edition, and referenced standards.
- D. Have available at the project field office a copy of the referenced standards.

#### 1.3 SUBMITTALS

- A. Provide shop drawings for duct materials, flues.
- B. Submit duct pressure testing reports. Provide individual reports for each AHU duct system.

#### 1.4 AIR DISTRIBUTION DUCT SYSTEM

- A. General: Ductwork, including collars, register boxes, fire dampers, exhaust fans, ventilation louvers, roof vents and screens, as well as dampers and other miscellaneous items not specifically mentioned but necessary for a complete installation. Apply the latest standards of SMACNA and ASHRAE with respect to sheet-metal gauge and general construction for round and rectangular ducts.

### PART 2 - PRODUCTS

#### 2.1 GALVANIZED SHEET-METAL DUCTWORK

- A. General: IMC Duct Construction Standards, latest edition, or latest edition of ASHRAE Guide Table 1-1/2 ounce galvanizing per square foot, both sides.

#### 2.2 FLEXIBLE DUCTS

- A. General: Comply with CMC, latest edition, Class 0 or Class 1.
- B. Standard factory fabricated product, construct an inner wall of impervious vinyl or chlorinated polyethylene, permanently bonded to a vinyl or zinc-coated spring steel helix. Cover the assembly

# EXHIBIT C

## Ductwork

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with fiberglass blanket insulation covered by an outer wall of vinyl or fiberglass-reinforced metalized vapor barrier. UL 181 listed Class 1 flexible air duct material. Overall thermal transmission no more than 0.25 (BTU/in)/(hr/sq.ft./deg. F) at 75F differential, per ASTM C335. Vapor transmission value no more than 0.10 perm, per ASTM E96. Rated for a minimum of 4-inch w.g. positive pressure and 1-inch w.g. negative pressure.

- C. Air friction correction factor of 1.3 maximum at 1000 FPM. Working air velocity of at least 2000 FPM. Flame spread rating no more than 25. Smoke development rating no more than 50 as tested per ASTM E84. Must have cataloged data on insertion loss characteristics, minimum attenuation of 29 DB for 10-foot straight length at 8-inch diameter and 500 Hz.
- D. Manufacturers: J. P. Lamborn Co., Norflex, Clevaflex, Genflex, Atco, Flexmaster, Thermaflex, or approved.

### 2.3 SHEET-METAL DUCT SEALER

- A. Hardcast "Duct-Seal 321" or United McGill. Indoor/outdoor, low VOC (<80 grams/liter), water based with fiber reinforcement.

### 2.4 PREFABRICATED DUCT JOINTS

- A. Manufactured flanged traverse rectangular and round duct joints.
- B. Manufacturers: Ductmate, Mez, Ward Duct Connectors, Lockformer TDC, or approved.

## PART 3 - EXECUTION

### 3.1 INSTALLATION

- A. The duct layout shown on the Contract Drawings is diagrammatic in nature. Coordinate the ductwork routing and layout, and make alterations to the ductwork routing and layout as required to eliminate physical interferences. Where deviations in the ductwork routing as shown in the Contract Drawings are required, such alterations not to compromise the air flow, pressure drop, and sound characteristics of the duct fitting or run as shown on the Contract Drawings. Make such determination by Architect. In the event Architect determines that the installed ductwork is inconsistent with the above mentioned criteria, remove and replace at no additional cost to the Owner.
- B. Install ductwork in the location and manner shown and detailed. Review deviations required by job conditions with Architect prior to fabrication. Provide fittings construction per SMACNA.
- C. Connect duct assemblies such as ductwork, plenums, etc., and operating machines or mechanisms such as fans, air conditioners, etc., with flexible connections per Section 23 05 48, Vibration and Seismic Controls for HVAC Piping and Equipment.
- D. Fabricate radius elbows with centerline radius not less than 1-1/2 duct diameters.
- E. Do not install duct size transition pitch angles which exceed 30 degrees for reductions in duct size in the direction of airflow, and 15 degrees for expansions in duct size in the direction of airflow.
- F. Install single thickness turning vanes in square throat rectangular elbows and in tees. Provide 3/4-inch trailing edge on turning vanes, turned slightly past parallel to the duct.
- G. Duct sizes indicated are free inside dimensions including where internal lining is shown.
- H. Provide galvanized sheet-metal duct material for ducts unless otherwise indicated or specified.
- I. Provide temporary closures of open ducts during construction to prevent dust and debris from entering the system.
- J. Flexible Duct:
  - 1. Install flexible duct with bend radius equal to 1.5 times the diameter. Minimum length 2 feet. Maximum length 5 feet, unless noted otherwise.
  - 2. Provide round neck grilles/diffusers or square-to-round transitions. No flex duct connections directly to square neck allowed.

# EXHIBIT C

## Ductwork

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3. Flex duct allowed only for vertical drops to diffusers. Maximum offset angle from vertical: 30 degrees.
  4. Approved for use on supply ducts only; not allowed for return or exhaust.
  5. Flex duct allowed in concealed spaces above lay-in ceilings only.
- K. Fabricate ductwork and sheet metal work of prime grade, lock forming quality steel in accordance with the current issues of the ASHRAE "Guide" and SMACNA standards and installed in strict conformance with SMACNA standards.
- L. Submit shop drawings for approval for ductwork.
- M. Construct ductwork for 2-inch pressure class.
- N. Round spiral duct and fittings or where required due to available clearances, use flat oval ductwork and fittings upstream of terminal units manufactured by United Sheet Metal, Rolok or approved in accordance with ASTM A527.
- O. Seal joints and seams in supply, exhaust, and return air ductwork and plenums.
- P. Fabricate ductwork and plenums with a smooth inside surface and support and brace to prevent sagging and vibration. Provide galvanized steel angles for reinforcing and bracing.
- Q. Joints:
1. Carefully cut and trim joints and seams in fabricated ducts and fitting to form a closed joint with no portion of the duct or fitting protruding into the air stream.
  2. Seal joints in sheet-metal ducts in concealed locations (such as enclosed ceiling spaces) with Hardcast joint sealant system applied in accordance with manufacturer's recommendations, or use Ductmate-type joints.
  3. Seal joints in sheet-metal ducts in exposed locations with sealant system applied in accordance with manufacturer's recommendations. Wipe off excess sealer on duct to give a clean finish, or use Ductmate-type joints.
  4. To connect sheet-metal ductwork to fiberglass ductboard, use Hardcast only.
  5. Standard gray duct tape not allowed.
- R. Fasteners such as sheet-metal screws, machine screws or rivets to be cadmium plated.
- S. Crimp flat duct surfaces diagonally or beaded regardless of size, unless acoustically lined.
- T. Fabricate duct size transitions with a slope of not more than 1 foot to 5 feet where possible, but in no case more than 1 foot in 3 feet.
- U. Fabricate duct turns with the inside (smallest) radius at least equal to the duct width. Where necessary, square elbows may be used, with maximum available inside radius and with fixed single thickness curved vanes, with trailing edge extended 3/4 inch.
- V. Provide flexible connectors at connections to equipment, in ducts crossing building expansion joints and may be used at connections of dissimilar metals. Flexible Connections: Minimum 16 ounce airtight "Ventglass" noncombustible fabric with fire retardant neoprene coating on outside, fastened with bolted galvanized steel bands. Maintain a minimum 1-inch space between the connecting surfaces.
- W. Duct Hangers and Supports:
1. Hang rectangular sheet-metal ducts with a cross sectional area of less than 7 sq.ft. with galvanized strips of No. 16 USS gauge steel 1 inch wide, and larger ducts with steel angles and adjustable hanger rods similar to piping hangers. Support at 8 feet on center, as detailed.
  2. Anchor ducts securely to building in such a manner as to prevent transmission of vibration to structure. Do not connect duct hanger straps to roof deck. Do not support ducts from other ducts or piping.
  3. For round sheet-metal ducts, provide duct support in accordance with SMACNA Guidelines. Verify type of building construction.
  4. Attach strap hangers installed flush with end of sheet-metal duct run to duct with sheet-metal screws.



# EXHIBIT C

## Ductwork

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5. Do not install duct stiffeners on interior (air side) of unlined ductwork; install on exterior only or on interior of ductwork with duct liner.
  6. Seismic Restraint: Brace ductwork against lateral movement as detailed in document "Seismic Restraint Manual Guidelines for Mechanical Systems" as published by SMACNA.
- X. Ductwork not to be supported from the roof deck. Hang ducts from beams, joists or supplementary structural members provided by Contractor. Do not hang ductwork from joist bridging or from other ducts.
- Y. Although not necessarily indicated on the Drawings, provide turning vanes at mitered elbows, opposed blade balancing dampers with locking quadrants at branch ducts, volume extractors and other applicable devices necessary for minimum duct resistance and proper system air balancing. Sufficiently stiffen dampers to prevent noise or vibration and in no case be lighter than 20 gauge steel. Provide with accessibly located adjuster, manufactured by Young Regulator Co., Parker Kalon Corporation, or approved.
- Z. Construct exterior ductwork or ductwork which is otherwise exposed to weather watertight.
- AA. Increase the size of sheet-metal ducts as required to accommodate insulation lining.
- BB. Locate access doors in ductwork as required for service of fire dampers, automatic dampers and other items requiring maintenance or inspection.
- CC. Smoke Detectors: Mount in duct per listing requirements, with detector in serviceable location. Adjust duct layout as required to meet velocity and clearance listing.

### 3.2 DUCTWORK PRESSURE TESTING

- A. Provide air pressure testing at 1.5 times maximum design static pressure (fan selection point). Test ductwork prior to connection to fan equipment. Repair leaks and retest until stipulated results are achieved.
1. Test at positive static pressure for 5 minutes with maximum air leakage not to exceed 1 percent of rated flow.
  2. Testing machine: Meet requirements of SMACNA standards. Pacific Air Products "Port-O-Lab," Rolok, United Sheet Metal, or approved.
  3. Test supply systems prior to connecting VAV boxes.
  4. Perform tests in the presence of Owner's Representative. Give 48 hours advance notice before commencement of each test.
  5. Test ductwork systems in sections as large as possible and record test results according.
  6. Coordinate testing with ceiling installation.
    - a. Provide sheet-metal plates and install between each duct test section (applies to main-to-main fittings, branch-to-branch fittings and main-to-branch fittings). At each plate location, fabricate joint with Ductmate. Insert 14 gauge sheet metal between Ductmate using a neoprene gasket on both sides of metal plate.
    - b. Leave plates in place until isolated section has been tested and approved by Owner's Representative.
    - c. Once sections have passed test, remove plates and reattach Ductmate joints. After fan unit is running, test joint for leakage by using a mixture of soap and water. If noise or bubbling occurs, reseal joint. Owner's representative to witness this procedure.

END OF SECTION 23 31 00

# EXHIBIT C

Air Outlets and Inlets

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## AIR OUTLETS AND INLETS

SECTION 23 37 00

### PART 1 - GENERAL

#### 1.1 SUMMARY

- A. Work Included: Materials, installation, and testing of HVAC outlets and inlets.

#### 1.2 QUALITY ASSURANCE

- A. Components: Tested, rated and certified per Air Diffusion Council procedures.
- B. Air Movement and Control Association Int'l (AMCA) Compliance: Test and rate louvers in accordance with AMCA 500, "Test Method for Louvers, Dampers and Shutters." Provide louvers bearing AMCA Certified Rating Seal.

#### 1.3 SUBMITTALS

- A. Manufacturer's catalog data on each of the following:
  - 1. Type of register, diffuser, grille, frame, louver, and dampers.
  - 2. Schedule of air outlets and inlets indicating drawing designation, model number and accessories furnished.
  - 3. Louvers: Performance data indicating face area, free area velocity, and corresponding pressure drop and water penetration data.

### PART 2 - PRODUCTS

#### 2.1 GRILLES, REGISTERS, DIFFUSERS

- A. Subject to compliance with requirements, provide products of one of the following.
- B. Provide 1-, 2-, 3-, or 4-way deflection as indicated.
- C. Register Dampers: Dampers utilized with grilles. Opposed blade dampers utilizing a side operated worm drive that provides external duct operation. Slot the end of the shaft to receive a screwdriver. Factory assembled side operator. Construct of the same material as the grille. Manufacturers: Same as grilles and diffusers.
- D. Coordinate mounting frames with construction types per finish schedule.
- E. Performance: Provide components that have velocity, throw and drop, and noise criteria ratings for each size device as listed in manufacturer's current standard literature, which are plus or minus 10 percent of the components as listed in the Diffuser, Register and Grille Schedule, or as specified herein.
- F. Manufacturers: Agitaire, Air Concepts, Anemostat, Carnes, Connor, Environmental Air Products, Hart & Cooley, J&J Register, Krueger, Metalaire, Nailor, Price Co, Shoemaker, Titus, Tuttle & Bailey, Seiho.

# EXHIBIT C

## Air Outlets and Inlets

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### PART 3 - EXECUTION

#### 3.1 INSTALLATION

- A. Install grilles, registers, and diffusers per manufacturer's instructions. Locate and size openings through finished surfaces to provide complete coverage of rough openings by integral device flanges or auxiliary frames.
- B. Paint exterior of devices per color selected by Architect.
- C. Coordinate duct connections with device final dimensions. Provide square to round adapters where required for connection to round ducts.
- D. Adjust the throws of air outlets to eliminate drafts.

END OF SECTION 23 37 00

# EXHIBIT C

Electrical Basic Requirements

## ELECTRICAL BASIC REQUIREMENTS

SECTION 26 00 00

### PART 1 - GENERAL

#### 1.1 SECTION INCLUDES

- A. Work included in 26 00 00, Electrical Basic Requirements applies to Division 26, Electrical work to provide materials, labor, tools, permits, incidentals, and other services to provide and make ready for Owner's use of electrical systems for proposed project.
- B. Contract Documents include, but are not limited to, Specifications including Division 00, Procurement and Contracting Requirements and Division 01, General Requirements, Drawings, Addenda, Owner/Architect Agreement, and Owner/Contractor Agreement. Confirm requirements before commencement of work.
- C. Provide coordination with all required utility companies prior to commencement of work to confirm final utility requirements.

#### 1.2 RELATED SECTIONS:

- A. Contents of Section applies to Division 26, Electrical Contract Documents.
- B. Related Work:
  - 1. Additional conditions apply to this Division including, but not limited to:
    - a. Specifications including Division 00, Procurement and Contracting Requirements and Division 01, General Requirements.
    - b. Drawings
    - c. Addenda
    - d. Owner/Architect Agreement
    - e. Owner/Contractor Agreement
    - f. Codes, Standards, Public Ordinances and Permits

#### 1.3 REFERENCES AND STANDARDS

- A. References and Standards per Division 00, Procurement and Contracting Requirements and Division 01, General Requirements, individual Division 26, Electrical Sections and those listed in this Section.
- B. Codes to include latest adopted editions, including current amendments, supplements and local jurisdiction requirements in effect as of the date of the Contract Documents, of/from:
  - 1. State of California:
    - a. CBC California Building Code
    - b. CEC California Electrical Code
    - c. CEC T24 California Energy Code Title 24
    - d. CFC California Fire Code
    - e. CMC California Mechanical Code
    - f. CPC California Plumbing Code
- C. General: Reference standards and guidelines include but are not limited to the latest adopted editions from:
  - 1. ADA Americans with Disabilities Act
  - 2. ANSI American National Standards Institute
  - 3. ETL Electrical Testing Laboratories
  - 4. FCC Federal Communications Commission

# EXHIBIT C

## Electrical Basic Requirements

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5.	IBC	International Building Code
6.	IEC	International Electrotechnical Commission
7.	IEEE	Institute of Electrical and Electronics Engineers
8.	IES	Illuminating Engineering Society
9.	LEED	Leadership in Energy and Environmental Design
10.	NEC	National Electric Code
11.	NECA	National Electrical Contractors Association
12.	NEMA	National Electrical Manufacturers Association
13.	NFPA	National Fire Protection Association
14.	OSHA	Occupational Safety and Health Administration
15.	UL	Underwriters Laboratories Inc.

- D. See Division 26, Electrical individual Sections for additional references.
- E. Where code requirements are at variance with Contract Documents, meet code requirements as a minimum requirement and include costs necessary to meet these in Contract. Install equipment provided per manufacturer recommendations.
- F. Whenever this Specification calls for material, workmanship, arrangement or construction of higher quality and/or capacity than that required by governing codes, higher quality and/or capacity take precedence.

### 1.4 SUBMITTALS

- A. See Division 01, General Requirements for Submittal Procedures as well as individual Division 26, Electrical Sections.
- B. In addition:
  - 1. Provide product submittals and shop drawings in electronic .pdf format only.
  - 2. Product Data: Provide manufacturer's descriptive literature for products specified in Division 26, Electrical Sections.
  - 3. Identify/mark each submittal in detail. Note what differences, if any, exist between the submitted item and the specified item. If differences are not identified and/or not discovered during the submittal review process, Contractor remains responsible for providing equipment and materials that meet the specifications and drawings.
    - a. Label submittal to match numbering/references as shown in Contract Documents. Highlight and label applicable information to individual equipment or cross out/remove extraneous data not applicable to submitted model. Clearly note options and accessories to be provided, including field installed items. Highlight connections by/to other trades.
    - b. Include technical data, installation instructions and dimensioned drawings for products, fixtures, equipment and devices installed, furnished or provided. Reference individual Division 26, Electrical specification Sections for specific items required in product data submittal outside of these requirements.
    - c. See Division 26, Electrical individual Sections for additional submittal requirements outside of these requirements.
  - 5. Maximum of two reviews of complete submittal package. Arrange for additional reviews and/or early review of long-lead items; Bear costs of these additional reviews at Engineer's hourly rates. Incomplete submittal packages/submittals will be returned to contractor without review.
  - 6. Trade Coordination: Include physical characteristics, electrical characteristics, device layout plans, wiring diagrams, and connections as required per Division 26, Electrical Coordination Documents. For equipment with electrical connections, furnish copy of approved submittal for inclusion in Division 26, Electrical submittals.
  - 7. Make provisions for openings in building for admittance of equipment prior to start of construction or ordering of equipment.
  - 8. Shop Drawings:

# EXHIBIT C

## Electrical Basic Requirements

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- a. Provide coordinated shop drawings which include physical characteristics of all systems, device layout plans, and control wiring diagrams. Reference individual Division 26, Electrical specification Sections for additional requirements for shop drawings outside of these requirements.
  - b. Provide Shop Drawings indicating access panel locations, size and elevation for approval prior to installation.
9. Samples: Provide samples when requested by individual Sections.
10. Operation and Maintenance Manuals, Owners Instructions:
- a. Submit manufacturer's operation and maintenance instruction manuals and parts lists for equipment or items requiring servicing in .pdf format. Submit data when work is substantially complete and in same order format as submittals. Include name and location of source parts and service for each piece of equipment.
  - b. Thoroughly instruct Owner in proper operation of equipment and systems.
  - c. Copies of certificates of code authority inspections, acceptance, code required acceptance tests, and other special guarantees, certificates of warranties, specified elsewhere or indicated on Drawings.
11. Record Drawings:
- a. Maintain at site at least one set of as-built drawings for recording "As-constructed" conditions. Indicate on drawings changes to original documents by referencing revision document, and include buried elements, location of conduit, and location of concealed electrical items. Include items changed by field orders, supplemental instructions, and constructed conditions.

### 1.5 QUALITY ASSURANCE

- A. Regulatory Requirements: Work and materials installed to conform with all local, State and Federal codes, and other applicable laws and regulations.
- B. Drawings are intended to be diagrammatic and reflect the Basis of Design manufacturer's equipment. They are not intended to show every item in its exact dimensions, or details of equipment or proposed systems layout. Verify actual dimensions of systems (i.e. distribution equipment, duct banks, light fixtures, etc.) and equipment proposed to assure that systems and equipment will fit in available space. Contractor is responsible for design and construction costs incurred for equipment other than Basis of Design, including, but not limited to, architectural, structural, electrical, HVAC, fire sprinkler, and plumbing systems.
- C. Manufacturer's Instructions: Follow manufacturer's written instructions. If in conflict with Contract Documents, obtain clarification. Notify Engineer/Architect, in writing, before starting work.
- D. Items shown on Drawings are not necessarily included in Specifications or vice versa. Confirm requirements in all Contract Documents.
- E. UL Compliance: Provide products which are UL listed or labeled.

### 1.6 WARRANTY

- A. Provide written warranty covering the work for a period of one year from date of Substantial Completion.
- B. Sections under this Division can require additional and/or extended warranties that apply beyond basic warranty.

### 1.7 COORDINATION DOCUMENTS

- A. Prior to construction, coordinate installation and location of HVAC equipment, ductwork, grilles, diffusers, piping, plumbing equipment/fixtures, fire sprinklers, plumbing, lights, cable tray and electrical services with

# EXHIBIT C

## Electrical Basic Requirements

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architectural and structural requirements, and other trades (including ceiling suspension and tile systems), and provide maintenance access requirements. Coordinate with submitted architectural systems (i.e. roofing, ceiling, finishes) and structural systems as submitted, including footings and foundation. Identify zone of influence from footings and ensure systems are not routed within the zone of influence.

- B. Advise Architect in event a conflict occurs in location or connection of equipment. Bear costs resulting from failure to properly coordinate installation or failure to advise Architect of conflict.
- C. Verify in field exact size, location, and clearances regarding existing material, equipment and apparatus, and advise Architect of discrepancies between that indicated on Drawings and that existing in field prior to installation related thereto.

## PART 2 - PRODUCTS

### 2.1 MANUFACTURERS

- A. Provide like items from one manufacturer.

### 2.2 MATERIALS

- A. Materials, equipment, and fixtures used for construction are to be new.

## PART 3 - EXECUTION

### 3.1 ACCESSIBILITY AND INSTALLATION

- A. Install equipment requiring access (i.e., junction boxes, light fixtures, power supplies, motors, etc.) so that they may be serviced, reset, replaced or recalibrated by service people with normal service tools and equipment. Do not install equipment in passageways, doorways, scuttles or crawlspaces which would impede or block the intended usage.
- B. Install equipment and products complete as directed by manufacturer's installation instructions. Obtain installation instructions from manufacturer prior to rough-in of equipment and examine instructions thoroughly. When requirements of installation instructions conflict with Contract Documents, request clarification from Architect prior to proceeding with installation. This includes proper installation methods, sequencing, and coordination with other trades and disciplines.
- C. Earthwork:
  - 1. Confirm Earthwork requirements in Contract Documents. In the absence of specific requirements, comply with individual Division 26, Electrical Sections and the following:
    - a. Perform excavation, dewatering, shoring, bedding, and backfill required for installation of work in this Division in accordance with related earthwork Sections. Contact utilities and locate existing utilities prior to excavation. Repair any work damaged during excavation or backfilling.
    - b. Excavation: Do not excavate under footings, foundation bases, or retaining walls.
    - c. Provide protection of underground systems. Review the project Geotechnical Report for references to corrosive or deleterious soils which will reduce the performance or service life of underground systems materials.
- D. Firestopping:

# EXHIBIT C

## Electrical Basic Requirements

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1. Confirm requirements in Division 07, Thermal and Moisture Protection. In the absence of specific requirements, comply with individual Division 26, Electrical Sections and the following:
  - a. Coordinate location and protection level of fire and/or smoke rated walls, ceilings, and floors. When these assemblies are penetrated, seal around piping and equipment with approved firestopping material. Install firestopping material complete as directed by manufacturer's installation instructions. Meet requirements of ASTM E814, Standard Test Method for Fire Tests of Through-Penetration Fire Stops.

E. Plenums:

1. In plenums, provide plenum rated materials that meet the requirements to be installed in plenums. Immediately notify Architect/Engineer of discrepancy.

F. Start up equipment, in accordance with manufacturer's start-up instructions, and in presence of manufacturer's representative. Test controls and demonstrate compliance with requirements. Replace damaged or malfunctioning controls and equipment.

G. Provide miscellaneous supports/metals required for installation of equipment and conduit.

### 3.2 REVIEW AND OBSERVATION

A. Notify Architect or Engineer, in writing, at following stages of construction so that they may, at their option, visit site for review and construction observation:

1. Underground conduit installation prior to backfilling.
2. Prior to covering walls.
3. Prior to ceiling cover/installation.
4. When main systems, or portions of, are being tested and ready for inspection by AHJ.

B. Final Punch:

1. Costs incurred by additional trips required due to incomplete systems will be the responsibility of the Contractor.

### 3.3 CUTTING AND PATCHING

A. Cutting, patching and repairing for work specified in this Division including plastering, masonry work, concrete work, carpentry work, and painting included under this Section and will be performed by skilled craftsmen of each respective trade in conformance with appropriate Division of Work.

B. Additional openings required in building construction to be made by drilling or cutting. Use of jack hammer is specifically prohibited. Patch openings in and through concrete and masonry with grout.

C. Restore new or existing work that is cut and/or damaged to original condition. Patch and repair specifically where existing items have been removed. This includes repairing and painting walls, ceilings, etc. where existing conduit and devices are removed as part of this project. Where alterations disturb lawns, paving, and/or walks, surfaces to be repaired, refinished and left in condition matching existing prior to commencement of work.

D. Additional work required by lack of proper coordination will be provided at no additional cost to the Owner.

### 3.4 DELIVERY, STORAGE AND HANDLING

A. Confirm requirements in Division 00, Procurement and Contracting Requirements and Division 01, General Requirements. In the absence of specific requirements, comply with individual Division 26, Electrical Sections and the following:



# EXHIBIT C

## Electrical Basic Requirements

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1. Handle materials delivered to project site with care to avoid damage. Store materials on site inside building or protected from weather, dirt and construction dust. Products and/or materials that become damaged due to water, dirt, and/or dust as a result of improper storage and handling to be replaced before installation.
2. Protect equipment to avoid damage. Close conduit openings with caps or plugs. Keep motors and bearings in watertight and dustproof covers during entire course of installation.

### 3.5 DEMONSTRATION

- A. Confirm Demonstration requirements in Division 00, Procurement and Contracting Requirements, Division 01, General Requirements, Section 26 08 00, Commissioning of Electrical and individual Division 26, Electrical Sections.
- B. Upon completion of work and adjustment of equipment, test systems and demonstrate to Owner's Representative, Architect, and Engineer that equipment furnished and installed or connected under provisions of these Specifications functions in manner required. Provide field instruction to Owner's Maintenance Staff.

### 3.6 CLEANING

- A. Upon completion of installation, thoroughly clean electrical equipment, removing dirt, debris, dust, temporary labels and traces of foreign substances. Throughout work, remove construction debris and surplus materials accumulated during work.

### 3.7 INSTALLATION

- A. Install equipment and fixtures in accordance with manufacturer's installation instructions, plumb and level and firmly anchored to vibration isolators. Maintain manufacturer's recommended clearances.
- B. Start up equipment, in accordance with manufacturer's start-up instructions, and in presence of manufacturer's representative. Test controls and demonstrate compliance with requirements. Replace damaged or malfunctioning controls and equipment.

### 3.8 PAINTING

- A. Confirm requirements in Division 01, General Requirements and Division 09, Finishes.

### 3.9 ACCESS PANELS

- A. Coordinate locations/sizes of access panels with Architect prior to work.

### 3.10 ACCEPTANCE

- A. System cannot be considered for acceptance until work is completed and demonstrated to Architect that installation is in strict compliance with Specifications, Drawings and manufacturer's installation instructions, particularly in reference to following:
  - a. Cleaning
  - b. Operation and Maintenance Manuals
  - c. Training of Operating Personnel
  - d. Record Drawings

# EXHIBIT C

## Electrical Basic Requirements

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- e. Warranty and Guaranty Certificates
- f. Start-up/Test Document and Commissioning Reports

### 3.11 FIELD QUALITY CONTROL

#### A. Tests:

1. Conduct tests of equipment and systems to demonstrate compliance with requirements specified. Reference individual Specification Sections for required tests. Document tests and include in operation and maintenance manuals.
2. During site evaluations by Architect or Engineer, provide appropriate personnel with tools to remove and replace trims, covers, and devices so that proper evaluation of installation can be performed.

END OF SECTION 26 00 00

# EXHIBIT C

Equipment Wiring

## EQUIPMENT WIRING

SECTION 26 05 09

### PART 1 - GENERAL

#### 1.1 SUMMARY

- A. Work included: Provision of materials, installation and testing of:
  - 1. Equipment connections.
  - 2. Equipment grounding.

#### 1.2 RELATED SECTIONS

- A. Contents of Division 26, Electrical and Division 01, General Requirements apply to this Section.

#### 1.3 SUBMITTALS

- A. Submittals as required by Section 26 00 00, Electrical Basic Requirements and Division 01, General Requirements.

### PART 2 - PRODUCTS

#### 2.1 MATERIALS

- A. Materials and Equipment for Equipment Wiring: As specified in individual Sections.

### PART 3 - EXECUTION

#### 3.1 EXAMINATION

- A. Prior to submittal of product data for electrical distribution equipment, obtain and examine product data and shop drawings for equipment furnished by the Owner and by other trades on the project. Update the schedule of equipment electrical connections accordingly, noting proper ratings for overcurrent devices, fuses, safety disconnect switches, conduit and wiring, and the like. As a minimum, this requirement applies to equipment furnished by Owner and equipment furnished under the following divisions of work under this contract:
  - 1. Division 10, Specialties.
  - 2. Division 11, Equipment.
  - 3. Division 14, Conveying Equipment.
  - 4. Division 21, Fire Suppression.
  - 5. Division 22, Plumbing.
  - 6. Division 23, HVAC, Heating, Ventilating and Air Conditioning.
- B. Unless otherwise noted in Contract Documents, the following voltage and phase characteristics apply to motors:
  - 1. 1/2 HP and Under: 120 volt, 1 phase.
  - 2. 3/4 HP and Over: 208 volt, 3 phase.

# EXHIBIT C

## Equipment Wiring

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- C. Verify mechanical and utilization equipment electrical characteristics with Drawings and equipment submittals prior to ordering equipment. Submit confirmation of this verification as a part of, or addendum to, the electrical product submittals.

### 3.2 INSTALLATION

- A. B. Provide moisture tight equipment wiring and switches in ducts or plenums used for environmental air.
- C. Connect motor and appliance/utilization equipment complete from panel to motor/equipment as required by code.
- D. Install motor starters and controllers for equipment furnished by others.
- E. Safety Switches: Provide as required by CEC and as directed in Section 26 28 16, Enclosed Switches and Circuit Breakers.
- F. Appliance/Utilization Equipment:
  - 1. Provide appropriate cable and cord cap for final connection unless equipment is provided with same. Provide receptacle configured to receive cord cap.
  - 2. Verify special purpose outlet NEMA configuration and ampere rating with equipment supplier prior to ordering wiring devices and coverplates.

### 3.3 FIELD QUALITY CONTROL

- A. Perform field inspection and testing in accordance with Division 01, General Requirements.

### 3.4 SYSTEMS STARTUP

- A. Provide field representative to prepare and start equipment.
  - 1. Test and correct for proper rotation of polyphase motors.
- B. Adjust for proper operation within manufacturer's published tolerances.
- C. Demonstrate proper operation of equipment to Owner's designated representative.

END OF SECTION 26 05 09

# EXHIBIT C

Grounding and Bonding for Electrical Systems

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## GROUNDING AND BONDING FOR ELECTRICAL SYSTEMS

SECTION 26 05 26

### PART 1 - GENERAL

#### 1.1 SUMMARY

- A. Work Included: Provision of materials, installation and testing of:
  - 1. Grounding Electrodes
  - 2. Connectors and Accessories
  - 3. Grounding Busbar
  - 4. Grounding Conductor

#### 1.2 RELATED SECTIONS

- A. Contents of Division 26, Electrical and Division 01, General Requirements apply to this Section.

#### 1.3 REFERENCES AND STANDARDS

- A. References and Standards as required by Section 26 00 00, Electrical Basic Requirements and Division 01, General Requirements.

#### 1.4 SUBMITTALS

- A. Submittals as required by Section 26 00 00, Electrical Basic Requirements and Division 01, General Requirements.
- B. In addition, provide:
  - 1. Test reports of ground resistance for service and separately derived system grounds.

#### 1.5 QUALITY ASSURANCE

- A. Quality assurance as required by Section 26 00 00, Electrical Basic Requirements and Division 01, General Requirements.
- B. In addition, meet the following:
  - 1. Comply with the requirements of ANSI/NFPA 70.

#### 1.6 WARRANTY

- A. Warranty of materials and workmanship as required by Section 26 00 00, Electrical Basic Requirements and Division 01, General Requirements.

# EXHIBIT C

## Grounding and Bonding for Electrical Systems

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### PART 2 - PRODUCTS

#### 2.1 MANUFACTURERS

- A. Grounding Electrodes:
  - 1. Weaver
  - 2. Thomas & Betts
  - 3. Talley
  - 4. Or approved equivalent.
  
- B. Grounding Connectors:
  - 1. Burndy Hyground Compression System
  - 2. Erico/Cadweld
  - 3. Amp Ampact Grounding System
  - 4. Or approved equivalent.
  
- C. Pipe Grounding Clamp:
  - 1. Burndy GAR Series
  - 2. O Z Gedney
  - 3. Thomas & Betts
  - 4. Or approved equivalent.
  
- D. Grounding Busbar:
  - 1. Chatsworth
  - 2. Erico
  - 3. Square D
  - 4. Panduit
  - 5. Or approved equivalent.

#### 2.2 GROUNDING ELECTRODES

- A. Ground Rods: Copper-clad steel, 3/4-inch diameter, 10-feet long, tapered point, chamfered top.

#### 2.3 CONNECTORS AND ACCESSORIES

- A. Grounding Connectors: Hydraulic compression tool applied connectors or exothermic welding process connectors or powder actuated compression tool applied connectors.
  
- B. Pipe Grounding Clamp: Mechanical ground connector with cable parallel or perpendicular to pipe.

#### 2.4 GROUNDING BUSBAR

- A. Grounding Busbar: 1/4-inch thick by 4-inch high by 10-inch long copper grounding busbar with insulators that meet ANSI J-STD-607-A specifications. UL 467 listed. Hole patterns in busbar to accommodate two-hole lugs, four-hole configuration.

# EXHIBIT C

## Grounding and Bonding for Electrical Systems

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### 2.5 GROUNDING CONDUCTOR

- A. Grounding Electrode Conductor: Soft-draw bare stranded copper for wire sizes larger than 10 AWG Bare. Solid copper for wire sizes 10 AWG and smaller.
- B. Equipment Grounding Conductor: Green insulated, insulation type to match that of associated feeder or branch circuit wiring, size as indicated on drawings.

## PART 3 - EXECUTION

### 3.1 EXAMINATION

- A. Verify site conditions prior to beginning work.
- B. Verify that final backfill and compaction have been completed before driving rod electrodes.

### 3.2 INSTALLATION

- A. Concrete-Encased Electrode ("Ufer ground"):
  - 1. From service equipment ground bus provide grounding electrode conductor to footing/foundation rebar.
  - 2. Bond grounding electrode conductor to three minimum 20-foot long 0.5-inch diameter independent steel rebars.
  - 3. Protect grounding electrode conductor from footing/foundation to service equipment grounding bus with rigid PVC conduit where grounding electrode conductor passes through concrete floor or other concrete structure. Do not use rigid metal conduit for grounding electrode conductor protection.
  - 4. Coordinate bonding of rebar with installer prior to placement of concrete.
- B. Ground Rod Electrode:
  - 1. Coordinate placement of ground rods and interconnecting conductor in base of building concrete footing prior to placement of concrete.
  - 2. Install stranded bare copper conductor in base of perimeter concrete footing, conductor size as shown on drawings.
  - 3. Layout conductor to provide maximum exposure to earth in the perimeter footing. Do not fold conductor.
  - 4. Bond to driven ground rods as indicated on Drawings.
  - 5. Tap at center ground rod and extend grounding electrode conductor to service grounding bus. Install grounding electrode conductor to service grounding bus in rigid PVC conduit for physical protection where grounding electrode conductor passes through concrete floor or other concrete structure.
- C. Water Service Grounding: Bond building ground electrode and water service pipe to service ground bus. Connect to water pipe on utility side of isolating fittings or meters, bond across water meters.
- D. Other Piping Systems: Bond gas piping system, fire sprinkler piping system and other metal piping systems to service equipment ground bus.
- E. Raceways:
  - 1. Ground metallic raceway systems. Bond to ground terminal with code size jumper except where code size or larger grounding conductor is included with circuit, use grounding bushing with lay-in lug.

# EXHIBIT C

## Grounding and Bonding for Electrical Systems

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2. Connect metal raceways, which terminate within an enclosure but without mechanical connection to enclosure, by grounding bushings and ground wire to grounding bus.
  3. Where equipment supply conductors are in flexible metallic conduit, install stranded copper equipment grounding conductor from outlet box to equipment frame.
  4. Install equipment grounding conductor, code size minimum unless noted on drawings, in nonmetallic raceway systems.
- F. Feeders and Branch Circuits:
1. Provide continuous green insulated copper equipment grounding conductors for feeders and branch circuits.
  2. Where installed in a continuous solid metallic raceway system and larger sizes are not detailed, provide insulated equipment grounding conductors for feeders and branch circuits sized in accordance with NEC Article 250, Table 250-122.
- G. Boxes, Cabinets, Enclosures and Panelboards:
1. Bond grounding conductors to enclosure with specified conductors and lugs. Install lugs only on thoroughly cleaned contact surfaces.
  2. Bond Sections of service equipment enclosure to service ground bus.
- H. Motors, Equipment and Appliances: Install code size equipment grounding conductor to (motor) equipment frame or manufacturer's designated ground terminal.
- I. Receptacles: Connect ground terminal of receptacle and associated outlet box to equipment grounding system. Self grounding nature of receptacle devices does not eliminate equipment grounding conductor bolted to outlet box.
- J. Install #4/0 AWG bare copper wire in foundation footing where indicated.
- K. Bond together metal siding not attached to grounded structure; bond to ground.
- L. Corrosion Inhibitors: Apply a corrosion inhibitor to contact surfaces when making grounding and bonding connections. Use corrosion inhibitor appropriate for protecting a connection between metals used.

### 3.3 FIELD QUALITY CONTROL

- A. Grounding system resistance to ground not to exceed 5 ohms. Make necessary modifications or additions to grounding electrode system for compliance. Provide final tests to assure that this requirement is met.
- B. Resistance of grounding electrode system: measure using a four-terminal fall-of-potential method as defined in IEEE 81. Ground resistance measurements made before electrical distribution system is energized and be made in normally dry conditions not less than 48 hours after last rainfall. Resistance measurements of separate grounding electrode systems be made before systems are bonded together below grade. Combined resistance of separate systems may be used to meet required resistance, but specified number of electrodes must still be provided.
- C. Inspect and test in accordance with NETA Standard ATS, Except Section 4.
- D. Perform inspections and tests listed in NETA Standard AB, Section 7.13.

END OF SECTION 26 05 26



# EXHIBIT C

Hangers and Supports for Electrical Systems and Equipment

## HANGERS AND SUPPORTS FOR ELECTRICAL SYSTEMS AND EQUIPMENT

SECTION 26 05 29

### PART 1 - GENERAL

#### 1.1 SUMMARY

- A. Work Included: Provision of materials, installation and testing of:
  - 1. Hangers, Supports, Anchors, Threaded Rod and Fasteners
  - 2. Support Channel
  - 3. Rooftop Conduit Supports
- B. Safety factor of 4 required for every fastening device or support for electrical equipment installed. Supports to withstand four times the weight of equipment it supports.

#### 1.2 RELATED SECTIONS

- A. Contents of Division 26 and Division 01, General Requirements apply to this section.

#### 1.3 REFERENCES AND STANDARDS

- A. References and Standards as required by Section 26 00 00 and Division 01, General Requirements.

#### 1.4 SUBMITTALS

- A. Submittals as required by Section 26 00 00 and Division 01, General Requirements.

#### 1.5 QUALITY ASSURANCE

- A. Quality assurance as required by Section 26 00 00 and Division 01, General Requirements.
- B. In addition, meet the following:
  - 1. Manufacturers regularly engaged in the manufacture of bolted metal framing support systems, whose products have been in satisfactory use in similar service for not less than 10 years.
  - 2. Support systems to be supplied by a single manufacturer.
  - 3. Engineering Responsibility: Design and preparation of Shop Drawings and calculations for each multiple pipe support, trapeze, equipment hangers/supports, and seismic restraint by a qualified Structural Professional Engineer.
    - a. Professional Engineer Qualifications: A professional engineer who is legally qualified to practice in jurisdiction where Project is located and who is experienced in providing engineering services of the kind indicated. Engineering services are defined as those performed for installations of hangers and supports that are similar to those indicated for this Project in material, design, and extent.

#### 1.6 WARRANTY

- A. Warranty of materials and workmanship as required by Section 26 00 00 and Division 01, General Requirements.

# EXHIBIT C

## Hangers and Supports for Electrical Systems and Equipment

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### 1.7 PERFORMANCE REQUIREMENTS

- A. General: Provide conduit and equipment hangers and supports in accordance with the following:
  - 1. When supports, anchorages, and seismic restraints for equipment and supports, anchorages and seismic restraints for conduit, cable tray and equipment are not shown on the Drawings, the Contractor is responsible for their design.
  - 2. Connections to structural framing shall not introduce twisting, torsion, or lateral bending in the framing members. Provide supplementary steel as required.
- B. Engineered Support Systems: The following support systems to be designed, detailed, and bear the seal of a professional engineer registered in the State of California.
  - 1. Support frames such as conduit racks or stanchions for conduit and equipment which provide support from below.
  - 2. Equipment and piping support frame anchorage to supporting slab or structure.
- C. Provide channel support systems, for conduits to support multiple conduits capable of supporting combined weight of support systems and system contents.
- D. Provide heavy-duty steel trapezes for piping to support multiple conduit capable of supporting combined weight of supported systems and system contents.
- E. Provide seismic restraint hangers and supports for conduit and equipment.
- F. Obtain approval from AHJ for seismic restraint hanger and support system to be installed for piping and equipment.

## PART 2 - PRODUCTS

### 2.1 MANUFACTURERS

- A. Support Channel:
  - 1. B-Line
  - 2. Kindorf
  - 3. Superstrut
  - 4. Unistrut
- B. Anchors:
  - 1. Anchor It
  - 2. Epcon System
  - 3. Hilti-Hit System
  - 4. Power Fast System
- C. Rooftop Supports:
  - 1. Cooper B-Line Dura-Block Rooftop Support Base

### 2.2 MATERIALS

- A. Hangers, Supports, Anchors, Threaded Rod and Fasteners - General: Corrosion-resistant materials of size and type adequate to carry the loads of equipment and conduit, including weight of wire in conduit.

# EXHIBIT C

## Hangers and Supports for Electrical Systems and Equipment

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- B. Strut hangers, corrosion resistant materials of size and type adequate to carry loads of equipment and conduit, including weight of wire in conduit:
  - 1. Channel Material: Carbon steel.
  - 2. Coating: Hot dip galvanized.
- C. Concrete Inserts: Cast in concrete for support fasteners for loads up to 800 lbs.
- D. Pipe Straps: Two-hole galvanized or malleable iron.
- E. Luminaire Chain: 90 lb. test with steel hooks.
- F. Anchor Bolts for Area Luminaire Poles: As supplied by area luminaire pole manufacturer.
- G. Anchors and Fasteners:
  - 1. Obtain permission from Architect before using powder-actuated anchors.
  - 2. Concrete Structural Elements: Use expansion anchors.
  - 3. Steel Structural Elements: Use beam clamps, steel spring clips, steel ramset fasteners, or welded fasteners.
  - 4. Concrete Surfaces: Use expansion anchors.
  - 5. Hollow Masonry, Plaster, and Gypsum Board Partitions: Use toggle bolts or hollow wall fasteners.
  - 6. Solid Masonry Walls: Use expansion anchors.
  - 7. Sheet Metal: Use sheet metal screws.
  - 8. Wood Elements: Use wood screws.
- H. Rooftop Conduit Supports:
  - 1. Curb base made of 100 percent recycled rubber and polyurethane prepolymer with a uniform load
  - 2. Capacity of 500 pounds per linear foot of support.
  - 3. UV resistant.
  - 4. Steel frame: Steel, 14ga strut galvanized per ASTM A653 or 12ga strut galvanized per ASTM A653 for bridge series.
  - 5. Continuous block channel supports with 1inch gaps to allow water flow, bridge channel supports, extendable height channel supports and elevated single conduit supports.
  - 6. Attaching hardware: Zinc-plated threaded rod, nuts and attaching hardware per ASTM B633.
  - 7. fastened directly into rubber material with weather resistant type 12 lag screws.
  - 8. Provide load distribution plates when required for heavy loads.
  - 9. Finish: Black with safety yellow striping.

## PART 3 - EXECUTION

### 3.1 INSTALLATION

- A. Install hangers and supports as required to adequately and securely support electrical system components, in a neat and workmanlike manner, as specified in NECA 1.
- B. Verify mounting height of luminaires prior to installation when heights are not detailed.
- C. Install vertical support members for equipment and luminaires, straight and parallel to building walls.

# EXHIBIT C

## Hangers and Supports for Electrical Systems and Equipment

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- D. Install horizontally support members straight and parallel to ceilings or finished floor unless otherwise noted.
- E. Provide independent supports to structural member for electrical luminaires, materials, or equipment installed in or on ceiling, walls or in void spaces or over suspended ceilings.
- F. Do not use other trade's fastening devices as supporting means for electrical luminaires, equipment or materials.
- G. Do not fasten supports to pipes, ducts, mechanical equipment, or conduit.
- H. Do not use supports or fastening devices to support other than one particular item.
- I. Support conduits within 18-inches of outlets, boxes, panels, cabinets and deflections unless more stringently required by CEC or NEC.
- J. Maximum distance between supports not to exceed 8 foot spacing unless otherwise required by CEC or NEC.
- K. Support flexible conduits and metal clad cable within 12-inches of outlets, boxes, panels, cabinets and deflections unless otherwise required by CEC or NEC.
- L. Maximum distance between supports for flexible conduits and metal clad cable not to exceed 48-inches spacing unless otherwise required by CEC or NEC.
- M. Maximum distance between supports for rigid PVC conduits unless otherwise required by CEC or NEC is as follows:
  - 1. 1/2-inch or 3/4-inch and 1-inch conduit, 3-feet apart.
  - 2. 1-1/4-inch or 1-1/2-inch and 2-inch conduit, 4-feet apart.
  - 3. 2-1/2-inch and 3-inch conduit, 5-feet apart.
  - 4. 4-inch and 5-inch conduit, 6-feet apart.
  - 5. 6-inch conduit, 7-feet apart.
- N. Maximum distance between supports for auxiliary gutters and wireways unless otherwise required by CEC or NEC is as follows:
  - 1. Sheet metal auxiliary gutters and wireways - 4-feet apart horizontally and 10-feet vertically.
  - 2. Non-metallic auxiliary gutters and wireways - 30-inches apart horizontally and 3-feet vertically.
- O. Install strut hangers as instructed by strut manufacturer. Suspended strut hangers as instructed by strut manufacturer for the load, with a maximum spacing of 8-feet on center and within 2-feet of outlet box, cabinet, junction box or other channel raceway termination unless otherwise required by CEC or NEC.
- P. Coordinate routing of conduit racks with materials and equipment installed by other trades. Where conduit racks are exposed to view, coordinate location and installation with Architect for optimal appearance.
- Q. Securely suspend junction boxes, pull boxes or other conduit terminating housings located above suspended ceiling from floor above or roof structure to prevent sagging and swaying.
- R. Provide seismic bracing per CBC, IBC, or UBC requirements.
- S. Where service disconnects are mounted on building exterior, physically attach service disconnect to the building or structure served.

# EXHIBIT C

## Hangers and Supports for Electrical Systems and Equipment

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- T. Install surface-mounted cabinets and panelboards with minimum of four anchors.
- U. Use sheet metal channel to bridge studs above and below cabinets and panelboards recessed in hollow partitions.
- V. Use spring lock washers under fastener nuts for strut.

### 3.2 CUTTING AND DRILLING

- A. Do not drill or cut structural members without prior permission from Architect.

### 3.3 WET AND DAMP LOCATIONS

- A. In wet and damp locations use steel channel supports to stand cabinets and panelboards 1-inch off wall.

### 3.4 ROOFTOP SUPPORTS

- A. Consult roofing manufacturer for roof membrane compression capacities. If necessary, provide a compatible sheet of roofing material (rubber pad) under rooftop support to disperse concentrated loads and add further membrane protection.
- B. Do not use supports that will void roof warranty.
- C. Install supports per manufacturer's instructions and recommendations.
- D. Use properly sized clamps to suit conduit sizes.
- E. Install supports for rooftop raceways to raise raceways a minimum of 4-inches above the roof structure unless otherwise noted.

END OF SECTION 26 05 29

# EXHIBIT C

Boxes

## BOXES SECTION 26 05 34

### PART 1 - GENERAL

#### 1.1 SUMMARY

- A. Work included: Provision of materials, installation and testing of:
  - 1. Outlet Boxes
  - 2. Pull and Junction Boxes
  - 3. Box Extension Adapter
  - 4. Conduit Fittings
  - 5. Weatherproof Outlet Boxes
- B. Provide electrical boxes and fittings for a complete installation. Include but not limited to outlet boxes, junction boxes, pull boxes, bushings, locknuts and other necessary components.

#### 1.2 RELATED SECTIONS

- A. Contents of Division 26, Electrical and Division 01, General Requirements apply to this Section.
- B. In addition, reference the following:
  - 1. Section 26 05 33, Raceways
  - 2. Section 26 05 53, Identification for Electrical Systems

#### 1.3 REFERENCES AND STANDARDS

- A. References and Standards as required by Section 26 00 00, Electrical Basic Requirements and Division 01, General Requirements.

#### 1.4 SUBMITTALS

- A. Submittals as required by Section 26 00 00, Electrical Basic Requirements and Division 01, General Requirements.

#### 1.5 QUALITY ASSURANCE

- A. Quality assurance as required by Section 26 00 00, Electrical Basic Requirements and Division 01, General Requirements.

#### 1.6 WARRANTY

- A. Warranty of materials and workmanship as required by Section 26 00 00, Electrical Basic Requirements and Division 01, General Requirements.

# EXHIBIT C

## Boxes

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### PART 2 - PRODUCTS

#### 2.1 MANUFACTURERS

- A. Outlet Boxes:
  - 1. Bowers
  - 2. Hubbell
  - 3. Raco
  - 4. Steel City
  - 5. Thomas & Betts
  - 6. Or approved equivalent.
  
- B. Pull and Junction Boxes:
  - 1. B-Line
  - 2. Hoffman
  - 3. Or approved equivalent.
  
- C. Box Extension Adapter:
  - 1. Bell
  - 2. Carlon
  - 3. Raco
  - 4. Red Dot
  - 5. Steel City
  - 6. Thomas & Betts
  - 7. Or approved equivalent.
  
- D. Conduit Fittings:
  - 1. Killark
  - 2. O-Z Gedney
  - 3. Raco
  - 4. Steel City
  - 5. Thomas & Betts
  - 6. Or approved equivalent.
  
- E. Weatherproof Outlet Boxes:
  - 1. Pass and Seymour
  - 2. Bell
  - 3. Red Dot
  - 4. Carlon
  - 5. Or approved equivalent.

#### 2.2 OUTLET BOXES, COMMERCIAL INFIRMARY

- A. Luminaire Outlet: 4-inch octagonal box, 1-1/2-inches deep with 3/8-inch luminaire stud if required. Provide raised covers on bracket outlets and on ceiling outlets.
  
- B. Device Outlet: Installation of one or two devices at common location, minimum 4-inches square, minimum 1-1/2-inches deep. Single- or two-gang flush device raised covers.
  
- C. Telecom Outlet: Provide 4-inches square, minimum 2-1/8-inch deep box with two-gang plaster ring. Provide under provisions of Division 27, Communications.

# EXHIBIT C

## Boxes

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- D. Multiple Devices: Three or more devices at common location. Install one-piece gang boxes with one-piece device cover. Install one device per gang.
- E. Masonry Boxes: Outlets in concrete.
- F. Construction: For interior locations, provide galvanized steel outlet wiring boxes, of the type, shape and size, including depth of box, to suit each respective location and installation; constructed with stamped knockouts in back and sides, and with threaded holes with screws for securing box covers or wiring devices.
- G. Accessories: Provide outlet box accessories for each installation, including mounting brackets, wallboard hangers, extension rings, luminaire studs, cable clamps and metal straps for supporting outlet boxes, compatible with outlet boxes being used and meeting requirements of individual wiring situations.
- H. Noise Control: Provide acoustic putty pad to back side of each outlet box installed in acoustic rated walls.

### 2.3 BOXES, RESIDENTIAL APARTMENTS

- A. Provide non-metallic switch and outlet boxes within residential dwelling units. In areas other than dwelling units, provide steel boxes for commercial work as specified elsewhere in this section.
- B. Boxes made from PVC-polyvinyl chloride compound with quick cable entry feature are acceptable.
- C. Provide boxes equal to Cooper Crouse-Hinds non-metallic switchboxes.

### 2.4 PULL AND JUNCTION BOXES

- A. Construction: Provide ANSI 49 gray enamel painted sheet steel junction and pull boxes, with screw-on covers; of type shape and size, to suit each respective location and installation; with welded seams and equipped with stainless steel nuts, bolts, screws and washers.
- B. Location:
  - 1. Provide junction boxes above accessible ceilings for drops into walls for receptacle outlets from overhead.
  - 2. Provide junction boxes and pull boxes to facilitate installation of conductors and limiting accumulated angular sum of bends between boxes, cabinets and appliances to 270 degrees.

### 2.5 BOX EXTENSION ADAPTER

- A. Construction: Diecast aluminum.
- B. Location: Install over flush wall outlet boxes to permit flexible raceway extension from flush outlet to fixed or movable equipment. Bell 940 Series, Red Dot IHE4 Series.

### 2.6 CONDUIT FITTINGS

- A. Requirements: Provide corrosion-resistant punched-steel box knockout closures, conduit locknuts and plastic conduit bushings of the type and size to suit each respective use and installation.



# EXHIBIT C

## Boxes

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### 2.7 WEATHERPROOF OUTLET BOXES

- A. Construction: Provide corrosion-resistant cast metal weatherproof outlet wiring boxes, of the type, shape and size, including depth of box, with threaded conduit ends, cast metal faceplate with spring-hinged waterproof cap suitably configured for each application, including faceplate, gasket, blank plugs and corrosion proof fasteners. Weatherproof boxes to be constructed to have smooth sides, gray finish.

## PART 3 - EXECUTION

### 3.1 EXAMINATION

- A. Verify locations of floor boxes and outlets in offices and work areas prior to rough-in.

### 3.2 INSTALLATION

- A. Install boxes securely, in a neat and workmanlike manner, as specified in NECA 1, Standard Practice of Good Workmanship in Electrical Construction.
- B. Secure boxes rigidly to substrate upon which they are being mounted, or solidly embed boxes in concrete or masonry.
- C. Install in locations as shown on Drawings, and as required for splices, taps, wire pulling, equipment connections, and as required by NFPA 70. Locate boxes and conduit bodies so as to ensure accessibility of electrical wiring.
- D. Set wall mounted boxes at elevations to accommodate mounting heights specified in Section.
- E. Electrical boxes are shown on Drawings in approximate locations unless dimensioned.
  - 1. Adjust box locations up to 10-feet if required to accommodate intended purpose.
- F. Mount center of outlet boxes, unless otherwise required by ADA, or noted on drawings, following distances above floor:
  - 1. Control Switches: 46-inches.
  - 2. Receptacles: 18-inches.
  - 3. Telecom Outlets: 18-inches. Coordinate with Division 27, Communications.
  - 4. Other Outlets: As indicated in other Sections of specifications or as detailed on drawings.
- G. Install pull boxes and junction boxes above accessible ceilings and in unfinished areas only.
- H. Inaccessible Ceiling Areas: Install outlet and junction boxes no more than 6-inches from ceiling access panel or from removable recessed luminaire.
- I. Flush Outlets in Insulated Spaces: Maintain integrity of insulation and vapor barrier.
- J. Install boxes to preserve fire resistance rating of partitions and other elements, using materials and methods specified in Division 07, Thermal and Moisture Protection.
- K. Coordinate electrical device locations and elevations (switches and receptacles) with architectural drawings to prevent mounting devices in mirrors, back splashes, and behind cabinets.
- L. Locate outlet boxes to allow luminaires positioned as shown on reflected ceiling plan.

# EXHIBIT C

## Boxes

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- M. Align adjacent wall mounted outlet boxes for switches, thermostats, and similar devices. Adjacent boxes not aligned vertically to be adjusted at no additional cost to Owner.
- N. Use flush mounting outlet box in finished areas.
- O. Locate flush mounting box in masonry wall to require cutting of masonry unit corner only. Coordinate masonry cutting to achieve neat opening.
- P. Do not install flush mounting box back-to-back in walls; provide minimum 12-inches separation. Provide minimum 24-inches separation in acoustic rated walls.
- Q. Apply acoustic putty pad on outlet box prior to installation of acoustical blanket.
- R. Secure flush mounting box to interior wall and partition studs. Accurately position to allow for surface finish thickness.
- S. Use stamped steel bridges to fasten flush mounting outlet box between studs.
- T. Install flush mounting box without damaging wall insulation or reducing its effectiveness.
- U. Use adjustable steel channel fasteners for hung ceiling outlet box.
- V. Do not fasten boxes to ceiling support wires.
- W. Support boxes independently of conduit, except cast box that is connected to two rigid metal conduits both supported within 12-inches of box.
- X. Use gang box where more than one device is mounted together. Do not use Sectional box.
- Y. Use gang box with plaster ring for single device outlets.
- Z. Use cast outlet box in exterior locations exposed to the weather and wet locations.
- AA. Large Pull Boxes: Use hinged enclosure in interior dry locations, surface-mounted cast metal box in other locations.
- AB. Box Color Coding and Marking: Reference Section 26 05 53, Identification for Electrical Systems.

### 3.3 ADJUSTING

- A. Adjust boxes to be parallel with building lines. Boxes not plumb to building lines are not acceptable.
- B. Install knockout closures in unused box openings.

### 3.4 CLEANING

- A. Clean interior of boxes to remove dust, debris, and other material.
- B. Clean exposed surfaces and restore finish.

END OF SECTION 26 05 34

# EXHIBIT C

Identification for Electrical Systems

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## IDENTIFICATION FOR ELECTRICAL SYSTEMS

SECTION 26 05 53

### PART 1 - GENERAL

#### 1.1 SUMMARY

- A. Work included: Provision of materials, installation and testing of:
  - 1. Nameplates and Labels
  - 2. Equipment Nameplates
  - 3. Device Labels
  - 4. Underground Warning Tape
- B. This section applies only to the commercial infirmary building and the non-dwelling areas of the residential apartment building.

#### 1.2 RELATED SECTIONS

- A. Contents of Division 26, Electrical and Division 01, General Requirements apply to this Section.

#### 1.3 REFERENCES AND STANDARDS

- A. References and Standards as required by Section 26 00 00, Electrical Basic Requirements and Division 01, General Requirements.

#### 1.4 SUBMITTALS

- A. Submittals as required by Section 26 00 00, Electrical Basic Requirements and Division 01, General Requirements.
- B. In addition, provide:
  - 1. Samples of Nameplates/Labels: One of each type.

#### 1.5 QUALITY ASSURANCE

- A. Quality assurance as required by Section 26 00 00, Electrical Basic Requirements and Division 01, General Requirements.
- B. In addition, meet the following:
  - 1. Manufacturer's Qualifications: Firms regularly engaged in manufacture of identification devices of types and sizes required.
  - 2. Codes and Standards: Comply with ANSI A13.1 for lettering size, length of color field, colors, and viewing angles of identification devices unless otherwise indicated.

# EXHIBIT C

## Identification for Electrical Systems

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### 1.6 WARRANTY

- A. Warranty of materials and workmanship as required by Section 26 00 00, Electrical Basic Requirements and Division 01, General Requirements.

## PART 2 - PRODUCTS

### 2.1 MANUFACTURERS

- A. General: Manufacturer's standard products of categories and types required for each application as referenced in other Division 26, Electrical Sections. Where more than a single type is specified for application, provide single selection for each product category.
- B. Equipment Nameplates:
  - 1. B & I Nameplates
  - 2. Intellicum
  - 3. JBR Associates
  - 4. Or approved equivalent.
- C. Device Labels:
  - 1. Kroy
  - 2. Brady
  - 3. Or approved equivalent.
- D. Underground Warning Tape:
  - 1. Allen Systems
  - 2. Brady
  - 3. Or approved equivalent.

### 2.2 NAMEPLATES AND LABELS

- A. Nameplates: Engraving stock melamine or lamicoïd plastic laminate in the size and thicknesses indicated, engraved with engraver's standard letter style of the sizes and wording indicated, black with white core (letter color), punched for mechanical fastening except where adhesive mounting is necessary because of substrate. Provide 1/8-inch thick material.
  - 1. Letter Color: White.
  - 2. Letter Height: 1/4 inch (6 mm).
  - 3. Background Color: Black.
  - 4. Fasteners: Self-tapping stainless steel screws, except contact-type permanent adhesive where screws cannot or should not penetrate the substrate.
  - 5. Access Panel Markers: Manufacturer's standard 1/16-inch thick engraved plastic laminate access panel markers, with abbreviations and numbers corresponding to concealed valve or devices/equipment. Include center hole to allow attachment.
  - 6. Locations:
    - a. Each electrical distribution and control equipment enclosure.
    - b. Communication cabinets.
    - c. Transformers.
    - d. Disconnect switches and starters.
- B. Labels: Adhesive tape, with 3/16-inch black letters on clear background. Use only for identification of individual wall switches and receptacles. Indicate device name, source panel, and source circuits. Panel

# EXHIBIT C

## Identification for Electrical Systems

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and circuit designation written in permanent marker on the back of the plate and inside the back-box. Do not provide Dymo tape style labels.

### 2.3 EQUIPMENT NAMEPLATES

- A. Engraved phenolic plastic, 1/16-inch thick with beveled edge border matching letter color. All upper case letters in engraver standard letter style. Embossed tape or dymo style labels, or similar, are not acceptable.
- B. Color:
  - 1. Normal (Utility): White letters on black background.
  - 2. Life Safety/Critical (Emergency Systems): Black letters on orange background per WAC 296-46B-700.9.
  - 3. Equipment Branch (Legally Required Standby Systems): Black letters on yellow background.
  - 4. X-Ray Branch (Optional Standby Systems): Black letters on white background.
- C. Letter Size:
  - 1. Use 1/2-inch letters minimum for identifying major equipment and loads, including switchgear, switchboards, etc.
  - 2. Use 1/4-inch letters minimum for identifying panels, breakers, etc.
  - 3. Use 3/16-inch minimum for identifying source, voltage, current, phase, and wire configurations.
- D. The Architect, Engineer, Commissioning Agent, and Owner reserve the right to make modifications to the nameplates as necessary.
- E. Nameplates: Engraving stock melamine or lamicoïd plastic laminate, Federal Specification L-P-387, in the size and thicknesses indicated, engraved with engraver's standard letter style of the sizes and wording indicated, black with white core (letter color), punched for mechanical fastening except where adhesive mounting is necessary because of substrate. Provide 1/8-inch thick material.
  - 1. Letter Color: White.
  - 2. Letter Height: 1/4-inch.
  - 3. Background Color: Black.
  - 4. Fasteners: Self-tapping stainless steel screws, except contact-type permanent adhesive where screws cannot or should not penetrate the substrate.

### 2.4 DEVICE LABELS

- A. Extra strength, laminated, adhesive tape, with 3/16-inch black letters on clear background. Use only for identification of individual wall switches, receptacles, control device stations, etc. Indicate source panel and circuits. Wall switches with engraved buttons do not require labeling. Embossed tape style labels, or similar, are not acceptable.
- B. Label all junction boxes to show system identification, source circuit, or raceway origin. In finished areas, utilize device label. In unfinished areas or above ceilings, use of permanent ink marker is acceptable.
- C. Where labels are provided, write identical information in permanent ink marker on the backside of the cover.

### 2.5 UNDERGROUND WARNING TAPE

- A. Description: 6-inch wide inert polyethylene plastic tape, 4-mil thick, detectable type, colored per APWA recommendations unless otherwise noted with suitable warning legend describing buried electrical lines.

# EXHIBIT C

## Identification for Electrical Systems

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### PART 3 - EXECUTION

#### 3.1 PREPARATION

- A. Degrease and clean surfaces to receive nameplates and labels.
- B. Coordinate designations used on Drawings with equipment labels.

#### 3.2 INSTALLATION

- A. Install nameplates and labels parallel to equipment lines.
- B. Secure nameplates to equipment front using self-tapping stainless steel screws.
- C. Secure nameplates to inside surface of door on panelboard that is recessed in finished locations.
- D. Identify underground raceways using underground warning tape. Install one continuous tape per underground raceway at 6- to 8-inches below finish grade. Where multiple underground raceways are buried in a common trench and exceeds 16-inch width, install multiple warning tapes not over 10-inches apart (edge to edge) over the entire group of underground raceways.
- E. Identify empty conduit and boxes with intended use.
- F. Provide wire markers on each conductor for power, control, signalling and communications circuits.
- G. On the back of receptacle and switch finish plates and inside the back-box, legibly write with permanent ink marker, the circuit that each device is connected to.
- H. Locations:
  - 1. Switchgear, switchboards, sub-distribution switchboards, distribution panels, and branch panels.
  - 2. Main breakers and distribution breakers in switchgear, switchboards, and distribution panels.
  - 3. Equipment including, but not limited to, motor controllers, disconnects, and VFD's.
  - 4. Low-voltage equipment enclosures including, but not limited to, fire alarm panels, nurse call panels, access control panels, and lighting control panels.
  - 5. Utility and distribution transformers.
- I. Switchgear, switchboards, and panels to include name source, voltage, current phase, wire configuration and fault current rating. Transformers to include source KVA, and secondary voltage, phase, and wire configuration.
- J. Provide nameplates for flush mounted branch panelboards identifying name on front door. On inside of door provide nameplate as noted above.
- K. Provide a second label at branch panelboards listing the means of identification of branch circuit conductors. This identification legend to consist of the color code used for each voltage system (208Y/120V and 480Y/277V). See specification Section 26 05 19, Low-Voltage Electrical Power Conductors and Cables, for required conductor color code for this project. Include identification of both voltage systems on each label, regardless of the voltage of the panelboard to which the label is affixed. Comply with requirements of NEC 210.5.
- L. Provide engraved nameplate similar to distribution panelboards for transformers, lighting control panels, contactors, relays, time switches, etc. identifying name, service point and circuit number.

# EXHIBIT C

## Identification for Electrical Systems

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- M. For flush mounted panelboards verify label location (inside or outside panelboard door) with Architect/Owner.
- N. Provide typewritten branch panel schedules with protective clear transparent covers accounting for every breaker installed. Use actual room designations assigned by name or number near completion of the work, and not the designations shown on drawings.

END OF SECTION 26 05 53

# EXHIBIT C

## OCCUPANCY SENSORS

SECTION 26 09 23

### PART 1 - GENERAL

#### 1.1 SUMMARY

- A. Work included: Provision of Materials, installation and testing of:
  - 1. Occupancy Sensors (Ceiling and Wall mounted)
  - 2. Combined Occupancy Sensor/Wall Switches ("Sensor/Switches")
  - 3. Automatic Switches

#### 1.2 RELATED SECTIONS

- A. Contents of Division 26 and Division 01, General Requirements apply to this Section.

#### 1.3 REFERENCES AND STANDARDS

- A. References and Standards as required by Section 26 00 00 and Division 01, General Requirements.

#### 1.4 SUBMITTALS

- A. Submittals as required by Section 26 00 00 and Division 01, General Requirements.
- B. In addition, provide:
  - 1. Provide wiring diagrams indicating low voltage and line voltage wiring requirements.
  - 2. Provide, on reproducible architectural floor plan, a layout of sensors indicating their sensing distribution.

#### 1.5 QUALITY ASSURANCE

- A. Quality assurance as required by Section 26 00 00 and Division 01, General Requirements.
- B. In addition, meet the following:
  - 1. Use manufacturer's published testing and adjusting procedures to adjust sensors time delay, daylight sensitivity, and passive infrared sensitivity to satisfaction of the Owner.
  - 2. Prepare and complete report of test procedures and results. Submit these test procedures and results to Owner.

#### 1.6 WARRANTY

- A. Warranty of materials and workmanship as required by Section 26 00 00 and Division 01, General Requirements.



# EXHIBIT C

## Occupancy Sensors

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### PART 2 - PRODUCTS

#### 2.1 MANUFACTURERS

- A. Passive Infrared Sensors:
  - 1. Greengate
  - 2. Leviton
  - 3. Or approved equivalent.
  
- B. Ultrasonic Occupancy Sensors:
  - 1. Greengate
  - 2. Leviton
  - 3. Or approved equivalent.
  
- C. Dual Technology Sensors:
  - 1. Greengate
  - 2. Leviton
  - 3. Or approved equivalent.
  
- D. Basis-of-Design: Occupancy sensor layout on Drawings are designed based on Greengate product line. Approved manufacturers listed are allowed on condition of meeting the specified conditions including complete sensor coverage of the area controlled and switching of luminaires in the area controlled. Provide additional sensors and power switch packs as needed to provide the same level of functionality as shown on Drawings or required for intended operation. Remove and replace electrical equipment installed not meeting these conditions at no cost to Owner.

#### 2.2 GENERAL

- A. Provide occupancy sensors to sense presence of human activity within desired space and enable or disable on/off manual lighting control function provided by local switches.
  
- B. Upon detection of human activity by detector, sensor initiates time delay to maintain lights on for present period of time. Field adjustable time delay setting from 5 to 30 minutes.
  
- C. Factory set sensors for maximum sensitivity.
  
- D. LED lamp built into sensor indicates when occupant is detected.
  
- E. Provide zero cross relay control with sensors and sensor/switched; relay contacts close and open with AC voltage signal is at zero.
  
- F. Where line voltage sensors and sensor/switches are used, provide to match voltage of controlled circuit.
  
- G. Line Voltage Sensors, Control Units, and Relays: UL listed.

#### 2.3 OCCUPANCY SENSORS (CEILING AND WALL MOUNTED)

- A. Passive Infrared Sensors:

# EXHIBIT C

## Occupancy Sensors

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1. Sensor Function: Detects human presence in floor area being controlled by detecting changes in Infrared energy. Sensor detects small movements, i.e., when people are writing while seated at a desk.
2. Provide temperature compensated dual element pyro-electric sensor and with multi element Fresnel lens.
3. Sensor utilizes DIP switches for adjustment to time delay and override. Field adjustable settings for sensitivity.
4. Provide daylight filter to ensure that sensor is insensitive to short-wavelength infrared waves, i.e., those emitted by sun.
5. Adjustments and mounting hardware under removable cover to prevent tampering with adjustments and hardware.
6. Sensor utilizes advanced digital signal processing technology to reduce false offs without reducing sensitivity.
7. Ceiling-Mounted Sensor:
  - a. 360 degree sensor range; coverage: 1200 SF, unless otherwise noted on drawings.
  - b. Low Voltage Sensor: 24VDC power. Sensor operates remote power switch packs. Multiple sensors can be wired in parallel allow coverage of large areas.
  - c. Provide internal form C dry contacts for HVAC control.
8. Wall-Mounted Sensor:
  - a. 90 degree sensor range with dense wide angle lens; coverage: 1000 SF for table top motion, unless otherwise noted on Drawings.
  - b. Swivel mounting bracket for corner mounting to wall or ceiling.
  - c. Low Voltage Sensor: 24VDC power. Sensor operates remote power switch packs. Multiple sensors can be wired in parallel allow coverage of large areas.
  - d. Provide internal form C dry contacts for HVAC control.
9. Building Exterior Sensor:
  - a. Capable of mounting on walls, eaves or ceilings.
  - b. On/off control based on daylight levels via adjustable light level setting.
  - c. Line Voltage: provide sensor to match voltage of lighting controlled; capable of switching up to 1000 watts ballast and incandescent load.
  - d. Adjustable time delay up to 15 minutes.
  - e. Silicon gasketed to prevent water and dust intrusion. UL listed raintight.
  - f. Rated to operate in temperatures from -40F to 130F.
  - g. Provide each sensor with manufacturer supplied wire-guard.
  - h. Coverage:
    1. Narrow beam up to 100 foot distance.
    2. 90 degree beam up to 50 foot distance.
      - i. Finish: White or as selected by Architect.

### B. Ultrasonic Occupancy Sensors:

# EXHIBIT C

## Occupancy Sensors

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1. Sensor Function: Detects human presence in controlled floor area by detecting Doppler shifts in 32kHz ultrasound created by sensor.
  2. Sensors are precision control and do not interfere with each other when two or more are placed in same area. Sensor includes advanced digital signal processing to reduce false on signals without decreasing sensitivity, as well as immunity to RFI/EMI sources.
  3. Sensor utilizes DIP switches for adjustment to time delay and override. Field adjustable settings for sensitivity.
  4. Ceiling-Mounted Sensor:
    - a. Maximum protrusion of 1.5-inches and blend in aesthetically with ceiling.
    - b. Coverage: 360 degree sensor range; coverage: 2,000 SF, unless otherwise noted on Drawings.
  5. Ceiling Mounted Sensor - Hallway Sensor Coverage:
    - a. Maximum protrusion of 1.5-inches and blend in aesthetically with ceiling.
    - b. Coverage: 90 lineal feet.
- C. Dual Technology Sensors:
1. General: Sensor has combined capability of passive infrared and ultrasonic sensors as described above.
  2. Function: Upon a person entering a space, motion must be sensed by both technologies before lighting will be turned on. After this has occurred, detection by either technology will hold lighting on. Sensors retrigger time delay where only one motion is necessary to turn on lights within 5 seconds after turning off.
  3. Wall-Mounted Sensor:
    - a. 90 degree sensor range with dense wide angle lens, coverage; 1000 SF for desktop motion, unless noted on drawings.
    - b. Swivel mounting bracket for corner mounting to wall or ceiling.
    - c. Low Voltage Sensor: 24VDC power. Sensor operates remote power switch packs. Multiple sensors can be wired in parallel allow coverage of large areas.
  4. Ceiling-Mounted Sensor:
    - a. 360 degree sensor range; coverage: 2000 SF for half-step motion, unless otherwise noted on Drawings.
    - b. Low Voltage Sensor: 24VDC power. Sensor operates remote power switch packs. Multiple sensors can be wired in parallel allow coverage of large areas.
- 2.4 COMBINED OCCUPANCY SENSOR/WALL SWITCHES ("SENSOR/SWITCHES")
- A. Completely self-contained sensor system that fits into standard single gang box. Internal transformer power supply, latching dry contact relay switching mechanism compatible with electronic ballasts, compact fluorescent and inductive loads. Triac and other harmonic generating devices are not allowed.
  - B. Passive infrared sensor technology includes advanced signal processing to reduce false triggers without increasing sensitivity. LED indicator blinks when occupant sensed.
  - C. Rated to switch loads: 800 watts incandescent or 120-volt ballast; 1200 watts for 277-volt ballast. Zero-crossing technology switches lighting off when AC voltage is at zero, minimizes contact wear.

# EXHIBIT C

## Occupancy Sensors

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- D. Provide integral off override switch with no leakage current to load or ground.
- E. Vandal-resistant lens.
- F. Finish: White or as selected by Architect.
- G. Standard Sensor/Switch:
  - 1. 180 degree sensor range coverage.

### PART 3 - EXECUTION

#### 3.1 INSTALLATION

- A. Install occupancy sensors as directed by manufacturer's instructions. Provide connections to control circuits, occupancy sensors, power supply packs and low voltage wiring.
- B. Verify with manufacturer representative that sensors are laid out to provide coverage across room space, adding additional sensors as needed.
- C. Provide power packs for sensor to control number of circuits and/or switch legs within its area of coverage.
- D. Field adjust each sensor to maximize its coverage of room space.
- E. Relocate sensors with ultrasonic technology to avoid being closer to HVAC diffusers and power packs than recommended by manufacturer.
- F. Field set time delay for each device as noted below:
  - 1. Activity and Conference Rooms: 30 minutes.
  - 2. Restrooms: 30 minutes.
  - 3. Storage Rooms, Janitor's Closets, Unisex Restrooms: 5 minutes.
  - 4. All Other Spaces: 15 minutes.

#### 3.2 LIGHTING SYSTEM TESTING AND COMMISSIONING

- A. Test lighting controls to ensure that control devices, components, equipment and systems are calibrated, adjusted and operate in accordance with Drawings and Specifications. Provide functional testing of sequences of operation to ensure operation in accordance with Drawings and Specifications. Provide complete report of test procedures and results to engineer and insert approved copy into project closeout documents.
- B. Testing includes:
  - 1. Daylight automatic controls.
  - 2. Occupant sensing automatic controls.
  - 3. Automatic time and override controls for interior lighting.
  - 4. Automatic time and photo controls for exterior lighting.

END OF SECTION 26 09 23

# EXHIBIT C

## Panelboards

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# PANELBOARDS

## SECTION 26 24 16

### PART 1 - GENERAL

#### 1.1 SUMMARY

- A. Work Included: Materials, installation and testing of:
  - 1. Panelboards
- B. Basis-of-Design: Eaton Electrical. Manufacturers listed are allowed on condition of meeting specified conditions including available space for the equipment and Code required working clearances. Remove and replace electrical equipment installed that does not meet these conditions at no cost to Owner.

#### 1.2 RELATED SECTIONS

- A. Contents of Division 26 and Division 01, General Requirements apply to this section.
- B. In addition, reference the following:
  - 1. Section 26 28 00, Overcurrent Protective Devices.

#### 1.3 REFERENCES AND STANDARDS

- A. References and Standards as required by Section 26 00 00 and Division 01, General Requirements.
- B. In addition, meet the following:
  - 1. UL 67, Standards for Panelboards.

#### 1.4 SUBMITTALS

- A. Submittals as required by Section 26 00 00 and Division 01, General Requirements.

#### 1.5 QUALITY ASSURANCE

- A. Quality assurance as required by Section 26 00 00 and Division 01, General Requirements.

#### 1.6 WARRANTY

- A. Warranty of materials and workmanship as required by Section 26 00 00 and Division 01, General Requirements.

# EXHIBIT C

## Panelboards

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### PART 2 - PRODUCTS

#### 2.1 MANUFACTURERS

- A. Eaton Electrical
- B. General Electric
- C. Siemens
- D. Square D
- E. Or approved equivalent.

#### 2.2 PANELBOARDS

- A. Description: Panelboards 400 amps or less. NEMA PB1, Type 1 or 3R as indicated on drawings, circuit breaker type. Maximum enclosure depth: 6-inches for surface mounted, 5 3/4-inches for flush mounted.
- B. Maximum Width: 20-inches.
- C. Integrated Equipment Rating: Provide fully rated integrated equipment rating greater than the available fault current. Series rated panelboards are not acceptable. Reference drawings for available fault current.
- D. Panelboard Bus Non-Reduced: Copper, ratings as indicated on drawings. Bus bar with suitable electroplating (tin) for corrosion control at connection. Provide copper ground bus in each panelboard.
- E. Lugs: Mechanical type for both aluminum and copper conductors.
- F. Provide double lugs and/or feed-through lugs for feed through feeders as noted on the drawings or panel schedules.
- G. Molded Case Circuit Breakers: Thermal magnetic trip circuit breakers, bolt-on type, with common trip handle for poles; UL listed. Predrill bus for bolt-on breakers.
  - 1. Type SWD for lighting circuits.
  - 2. Type HACR for heating, air conditioning and refrigeration equipment circuits.
  - 3. Class A ground fault interrupter circuit breakers where scheduled.
  - 4. Class B ground fault equipment protection circuit breakers for heat trace and other circuits as required by Code.
  - 5. Do not use tandem circuit breakers.
- H. Accessories: Provide where indicated: shunt trip, arc-fault circuit interruption (AFCI), Class A ground fault circuit interruption (GFCI), auxiliary switch and alarm switch.
- I. Cabinet Front: Provide flush or surface mounting as shown on the schedules, drawings, or otherwise noted. Cabinet front with concealed hinged front cover construction, metal directory frame with heavy clear plastic protector, flush lift latch and lock, two keys per panel all keyed alike.

# EXHIBIT C

## Panelboards

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- J. Provide boxes with removable blank end walls and interior mounting studs. Provide interior support bracket for ease of interior installation.
- K. Furnish surface mounted cabinet boxes without knockouts.
- L. Minimum Integrated Short Circuit Rating: 22,000 amperes symmetrical for 240 volt panelboards; 18,000 amperes symmetrical for 480 V panelboards or minimum rating as indicated on the drawings or panel schedules.

### PART 3 - EXECUTION

#### 3.1 INSTALLATION

- A. Install panelboards in accordance with NEMA PB 1.1, NECA 1 and manufacturers installation instructions.
- B. Install panelboards level and plumb. Install recessed panelboards flush with wall finishes.
- C. Height: 6-feet 6-inches to top of panelboard; install panelboards taller than 6-feet 6-inches with bottom no more than 4-inches above floor.
- D. Equipment arrangement in electrical room is based on one manufacturer. Coordinate space requirements with equipment supplier. Maintain code required and manufacturer's recommended clearances.
- E. Provide filler plates for unused spaces in panelboards.
- F. Provide typed circuit directory for each branch circuit panelboard. Include all "spaces" and "spares". Revise directory to reflect circuiting changes and as-installed conditions. Use final Owner designated room names and numbers, and not designations shown on drawings.
- G. Provide engraved plastic nameplates per Section 26 05 53, Identification for Electrical Systems.
- H. Provide permanent identification number in or on panelboard dead-front adjacent to each breaker pole position. Horizontal centerline of numbers to correspond with centerline of circuit breaker pole position.
- I. Ground and bond panelboard enclosure per NEC.
- J. Paint:
  - 1. Standard factory finish unless noted otherwise.
  - 2. Panelboards located in finished interior areas in view of building occupants: paint to match adjacent wall surface. Color and paint preparation as specified by Architect. Covers to be painted off wall, then installed over dried, painted wall surface.
- K. Provide arc flash labels.
- L. Provide handle guards on each circuit supplying obviously constant loads such as fire alarm, security, lighting controls, refrigerators and freezers, fire protection, etc.
- M. Provide handle tie to branch circuit breakers of multiwire branch circuits for simultaneous disconnection of circuits. Handle tie will be identified for use with circuit breakers provided. Reconfigure assigned circuits as necessary so that circuit breakers associate with multiwire branch circuits are physically adjacent, record changes in panelboard schedules and circuiting plans for record drawings.

# EXHIBIT C

## Panelboards

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- N. Provide interior wiring diagram, neutral wiring diagram, UL label, and short circuit rating on interior or in booklet format inserted in sleeve inside panel cover.
- O. Verify available recessing depth and coordinate wall framing with other divisions.
- P. Maintain fire rating of wall where panels are installed flush in fire rated walls.

### 3.2 FIELD QUALITY CONTROL

- A. Perform inspections and tests in accordance with manufacturer's requirements.

### 3.3 CLEANING

- A. Thoroughly clean exterior and interior of each panelboard in accordance with manufacturer's installation instructions.
- B. Vacuum construction dust, dirt, and debris out of each panelboard.
- C. Where enclosure finish is damaged, touch up finish with matching paint in accordance with manufacturer's specifications and installation instructions.

END OF SECTION 26 24 16



# EXHIBIT C

## Wiring Devices

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# WIRING DEVICES

## SECTION 26 27 26

### PART 1 - GENERAL

#### 1.1 SUMMARY

- A. Work Included: Provision of materials, installation and testing of:
  - 1. Switches and dimmer switches
  - 2. Receptacles
  - 3. GFCI receptacles
  - 4. Other wiring devices

#### 1.2 RELATED SECTIONS

- A. Contents of Division 26, Electrical and Division 01, General Requirements apply to this Section.

#### 1.3 REFERENCES AND STANDARDS

- A. References and Standards as required by Section 26 00 00, Electrical Basic Requirements and Division 01, General Requirements.

#### 1.4 SUBMITTALS

- A. Submittals as required by Section 26 00 00, Electrical Basic Requirements and Division 01, General Requirements.

### PART 2 - PRODUCTS

#### 2.1 DWELLING UNIT WIRING DEVICES

- A. SPST Switches: 15 amp, White, Leviton #5601-P2W.
- B. 3-way Switches: 15 amp, White, Leviton #5603-P2W.
- C. 4-way Switches: 15 amp, White, Leviton #5604-2W.
- D. Receptacles: Duplex convenience outlets. 15 amp, straight blade, grounding, 125 volt, Leviton #5325-S.
- E. GFCI Receptacles: 15 amp, White, Leviton #GFNL1-W.
- F. GFCI Receptacles: 20 amp, White, Leviton #GFNL2-W.
- G. Coverplates: White, nylon, to match wiring device.

# EXHIBIT C

## Wiring Devices

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### 2.2 NON-RESIDENTIAL WIRING DEVICES

- A. Toggle switch, Leviton #1221.
- B. Receptacle, 20 amp, Leviton #5362S.
- C. Receptacle, GFCI, Leviton #7599-3I.
- D. White-In-Use cover, polycarbonate: Pass & Seymour, Hubbell, Cooper, or approved equal.
- E. Cover plates, interior flush: Brushed stainless steel.
- F. Cover plates, interior surfaces: Raised galvanized steel.
- G. Cover plates, exterior: Fully gasketed.

### 2.3 WALL DIMMERS

- A. Provide wall dimmers compatible with type of load controlled (i.e. LED, line voltage, low voltage, 2-wire, 3-wire, 0-10v). Finish to match wall switches. Size dimmers to accept connected load. Do not cut fins. Where dimmers are ganged together, provide a single multi gang coverplate.

## PART 3 - EXECUTION

### 3.1 PREPARATION

- A. Finish Plates and Devices: Do not install items until finish painting is complete. Scratched or splattered finish plates and devices not acceptable.

### 3.2 INSTALLATION

- A. See Architectural elevations for location and mounting height of wiring devices. Review Architectural elevations prior to rough-in and contact Architect immediately if conflicts are found between Architectural and Electrical Drawings. Do not rough-in devices until conflicts are resolved.
- B. Install wiring devices and finish plates plumb with building lines, equipment cabinets and adjacent devices. Devices not plumb will be fixed at no additional cost to Owner.
- C. Orientation:
  - 1. Wall-Mounted Receptacles: Install with long dimension oriented vertically at centerline height shown on drawings or as specified.
  - 2. Vertical Alignment: When more than one outlet is shown on drawings in close proximity to each other, but at different elevations, align outlets on a common vertical center line for best appearance. Verify with Architect.
  - 3. Horizontal Alignment: When more than one outlet is shown on Drawings to be stacked in wall vertically, align outlets on a common horizontal center line for best appearance. Verify with Architect.
- D. GFCI Outlets: One GFCI receptacle may be used to provide GFCI protection to downstream duplex receptacles on same branch circuit. If GFCI receptacle is used, the following conditions must be met::
  - 1. Downstream receptacles are in same room as upstream GFCI duplex receptacles.

# EXHIBIT C

## Wiring Devices

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2. Downstream duplex receptacles are labeled as being protected by an upstream GFCI receptacle in same room.
- E. Provide 20 amp rated duplex receptacle in conditions where there is only one duplex receptacle on a 20 amp branch circuit.

### 3.3 LABELING

- A. Provide labeling per Section 26 05 53, Identification for Electrical Systems.
- B. Provide receptacle device plates with panel and circuit designation labeled on the face, with Dymo-type label, and with circuit written in permanent marker on back of plate and back-box. Provide switch device plates with panel and circuit designation written in permanent marker on back of plate and back-box.

END OF SECTION 26 27 26

# EXHIBIT C

Enclosed Switches and Circuit Breakers

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## ENCLOSED SWITCHES AND CIRCUIT BREAKERS SECTION 26 28 18

### PART 1 - GENERAL

#### 1.01 SUMMARY

A. Work included: Provision of materials, installation and testing of:

1. Toggle Type Disconnect Switches
2. Safety Switches

#### 1.02 RELATED SECTIONS

A. Contents of Division 26 and Division 01, General Requirements apply to this Section.

#### 1.03 REFERENCES AND STANDARDS

A. References and Standards as required by Section 26 00 00 and Division 01, General Requirements.

#### 1.04 SUBMITTALS

A. Submittals as required by Section 26 00 00 and Division 01, General Requirements.

#### 1.05 QUALITY ASSURANCE

A. Quality assurance as required by Section 26 00 00 and Division 01, General Requirements.

#### 1.06 WARRANTY

A. Warranty of materials and workmanship as required by Section 26 00 00 and Division 01, General Requirements.

### PART 2 - PRODUCTS

#### 2.01 MANUFACTURERS

A. Toggle Type Disconnect Switches:

1. Cooper

# EXHIBIT C

## Enclosed Switches and Circuit Breakers

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2. Hubbell
3. Leviton
4. Pass & Seymour
5. Slater

B. Safety Switches:

1. Eaton Electrical
2. General Electric
3. Siemens
4. Square-D

C. Enclosed Circuit Breakers:

1. Eaton Electrical
2. General Electric
3. Siemens
4. Square-D.

### 2.02 TOGGLE TYPE DISCONNECT SWITCHES

- A. Rating: 120 volt, 1 pole, 20 amps, 1 hp maximum.
- B. Rating: 208 volt, 2 pole, 20 amps, 1 hp maximum.
- C. Enclosure:
  1. NEMA 1 for dry locations.
  2. NEMA 3R for damp and wet locations.
- D. Handle lockable in 'off' position.

### 2.03 SAFETY SWITCHES

- A. Heavy duty fusible type and non-fusible type (as indicated on drawings), dual rate, quick-make, quick-break with fuse rejection feature for use with Class R fuses only, unless other fuse type is specifically noted.
- B. Clearly marked for maximum voltage, current, and horsepower.
- C. Operable handle interlocked to prevent opening front cover with switch in 'on' position.

# EXHIBIT C

## Enclosed Switches and Circuit Breakers

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- D. Switches rated for maximum available fault current.
- E. Handle lockable in 'off' position.
- F. Enclosure:
  - 1. NEMA 1 for dry locations.
  - 2. NEMA 3R for damp and wet locations.

### PART 3 - EXECUTION

#### 3.01 COORDINATION

- A. Obtain and review the submitted product data for equipment furnished by the Owner, and furnished under other Divisions of this contract, particularly under Divisions 22 and 23.
- B. Confirm the equipment nameplate maximum overcurrent protection (MOCP) and make accommodations and adjustments to switches, circuit breakers and conductors as necessary to coordinate with the nameplate rating.

#### 3.02 INSTALLATION

- A. Install in accordance with manufacturer's instructions.
- B. Install fuses in fusible disconnect switches.
- C. Provide engraved nameplates per Section 26 05 53, Identification for Electrical Systems.
- D. Provide arc flash labels.
- E. Coordinate fuse ampere rating with installed equipment. Fuse ampere rating variance between original design information and installed equipment, size in accordance with Bussmann Fusetron 40C recommendations. Do not provide fuses of lower ampere rating than motor starter thermal units.

END OF SECTION 26 28 18

# EXHIBIT C

Lighting

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## LIGHTING SECTION 26 51 00

### PART 1 - GENERAL

#### 1.1 SUMMARY

- A. Work Included: Provision of materials, installation and testing of:
  - 1. Luminaires
  - 2. Support, bases, footings, etc.
  - 3. Lamp's
- B. Provide wiring for complete and operating lighting system.

#### 1.2 RELATED SECTIONS

- A. Contents of Division 26, Electrical and Division 01, General Requirements apply to this Section.

#### 1.3 REFERENCES AND STANDARDS

- A. References and Standards as required by Section 26 00 00, Electrical Basic Requirements and Division 01, General Requirements.

#### 1.4 SUBMITTALS

- A. Submittals as required by Section 26 00 00, Electrical Basic Requirements and Division 01 General Requirements.
- B. In addition, provide:
  - 1. Submit:
    - a. Luminaires: Include electrical ratings, dimensions, mounting, material, required clearances, terminations, wiring and connection diagrams, photometric data, diffusers, and louvers.
    - b. Lamp's.

#### 1.5 QUALITY ASSURANCE

- A. Quality assurance as required by Section 26 00 00, Electrical Basic Requirements and Division 01, General Requirements.

### PART 2 - PRODUCTS

#### 2.1 LUMINAIRES

- A. Where recessed luminaires are installed in cavities intended to be insulated, provide IC rated luminaires or other code approved installation.

# EXHIBIT C

## Lighting

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- B. UL label luminaires installed under canopies, roof or open porches, and similar damp or wet locations, as suitable for damp or wet location.
- C. Suspended luminaires: Provide minimum 24-inch adjustability in aircraft cable length where used.
- D. Recessed Luminaires: Frame compatible with ceiling material installed at particular luminaire location. Provide proper factory trim and frame for luminaire to fit location and ceiling material. Verify with Architectural Reflected Ceiling Plan prior to submittals.

### 2.2 LAMPS

- A. Provide lamps for luminaires.
- B. LED:
  - 1. LED manufacturer will include, but not be limited to, light source, luminaire, power supply and control interface with added components as needed for complete and functioning system.
    - a. Comply with ANSI chromaticity standard for classifications of color temperature. See luminaire schedule for specified LED lamp color and color temperature. UL or ETL listed and labeled.
    - b. Luminaire testing per IESNA LM-79 and LM-80 procedures.
    - c. Lamp life for white LEDs: 50,000 plus hours with lamp failure occurring when LED produces 70 percent of initial rated lumens.
    - d. Lamp life for color LEDs: 30,000 plus hours with lamp failure occurring when LED produces 50 percent of its initial rated lumens.
    - e. LED Drivers: reverse polarity protection, open circuit protection, require no minimum load. Minimum 80 percent efficiency. Class A noise rating.
    - f. Dimming: LED system capable of full and continuous dimming.
    - g. LED light source manufacturers: Nichia, Cree, Osram Sylvania, GE Lumination.

## PART 3 - EXECUTION

### 3.1 INSTALLATION

- A. Install luminaires securely, in neat and workmanlike manner.
- B. Install luminaires of types indicated where shown and at indicated heights in accordance with manufacturer's written instructions and with recognized industry practices to ensure that luminaires comply with requirements and serve intended purposes.
- C. Align, mount and level luminaires uniformly. Use ball hangers for suspended stem mounted luminaires.
- D. Avoid interference with and provide clearance from equipment. Where indicated locations for luminaires conflict with locations for equipment, change locations for luminaire by minimum distance necessary as directed by Architect.
- E. Suspended Luminaires: Mounting heights indicate clearances between bottom of luminaire and finished floors.
- F. Interior Luminaire Supports:
  - 1. Support Luminaires: Anchor supports to structural slab or to structural members within a partition, or above a suspended ceiling.
  - 2. Maintain luminaire positions after cleaning.



# EXHIBIT C

## Lighting

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3. Support luminaires without causing ceiling or partition to deflect.
  4. Provide recessed luminaires with two support wires as outlined in IBC.
- G. Replace luminaires which have failed at substantial completion.
- H. Install suspended luminaires and exit signs using pendants supported from swivel hangers. Provide pendant length required to suspend luminaire at indicated height.
- I. Support luminaires larger than 2' X 4' independent of ceiling framing.
- J. Locate recessed ceiling luminaires as indicated on architectural reflected ceiling plan.
- K. Install surface mounted luminaires and exit signs plumb and adjust to align with building lines and with each other. Secure to prevent movement.
- L. Exposed Grid Ceilings:
  1. Support surface mounted luminaires in grid ceiling directly from building structure.
  2. Provide auxiliary members spanning ceiling grid members to support surface mounted luminaires.
  3. Fasten surface mounted luminaires to ceiling grid members using bolts, screws, rivets, or suitable clips.
- M. Install recessed luminaires to permit removal from below.
- N. Install recessed luminaires using accessories and firestopping materials to meet regulatory requirements for fire rating.
- O. Install clips to secure recessed grid-supported luminaires in place.
- P. Install wall mounted luminaires, emergency lighting units, and exit signs at height as indicated on Architectural Drawings.
- Q. Install accessories furnished with each luminaire.
- R. Make wiring connections to branch circuit using building wire with insulation suitable for temperature conditions within luminaire.
- S. Bond products and metal accessories to branch circuit equipment grounding conductor.
- T. Install specified lamps in each emergency lighting unit, exit sign, and luminaire.
- U. Where manufactured wiring assemblies are used, insure that wiring assembly manufacturer sends components to appropriate luminaire manufacturer for respective installation of proper components.

### 3.2 COORDINATION

- A. Coordination of Conditions: Coordinate ceiling construction, recessing depth and other construction details prior to ordering luminaires for shipment. Refer cases of uncertain applicability to Architect for resolution prior to release of luminaires for shipment. Where luminaires supplied do not match ceiling construction, replace luminaires at no cost to Owner.
- B. Electrical drawings are schematic, identifying quantity and type of luminaires used and their approximate location, but are not to be used for dimensional purposes. Reference architectural drawings for exact locations, including mounting heights.

# EXHIBIT C

## Lighting

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- C. Provide lighting indicated on drawings with luminaire of the type designated and appropriate for location.

### 3.3 FIELD QUALITY CONTROL

- A. Run all lighting continuously for 48 hours for burn-in. Inspect for proper connection and operation.

### 3.4 ADJUSTING

- A. Aim and adjust luminaires as indicated.
- B. Focus and adjust floodlights, spotlights and other adjustable luminaires, with Architect, at such time of day or night as required.
- C. Align luminaires that are not straight and parallel/perpendicular to structure.
- D. Position exit sign directional arrows as indicated.

### 3.5 CLEANING

- A. Clean electrical parts to remove conductive and deleterious materials.
- B. Remove dirt and debris from enclosures.
- C. Clean paint splatters, dirt, dust, fingerprints, and debris from luminaires.
- D. Clean photometric control surfaces as recommended by manufacturer.
- E. Clean finishes and touch up damaged finishes per by manufacturer's instructions.

### 3.6 CLOSEOUT ACTIVITIES

- A. Demonstrate luminaire operation for minimum of two hours.

END OF SECTION 26 51 00

## SECTION 16721

### FIRE DETECTION ALARM SYSTEM

#### PART 1 - GENERAL

##### 1.1 SUMMARY

- A. This Section includes all labor, materials, equipment, operations, or methods listed, mentioned or scheduled on the plans and/or herein specified, including all incidentals necessary and required for completion and proper operation of work under this Section.
- B. Provide and install fire alarm system as shown on project Drawings:
  - 1. The system shall include, but not be limited to the following elements:
    - a. Programming the fire alarm system Master system CPU and with modules as necessary to accommodate all new devices to be installed including all power supplies, batteries and chargers, fire detection and control modules, input and output devices and equipment enclosures.
    - b. Power supplies, batteries and battery chargers.
    - c. Equipment enclosures.
    - d. Intelligent addressable manual pull stations, heat detectors, analog smoke detectors, alarm monitoring modules, and supervised control modules.
    - e. Audible and visual evacuation signals.
    - f. Software and fireware as required to provide a complete functioning system.
    - g. Wiring, raceway, and all necessary cutting and patching.
    - h. Installation, testing, certification, and operator's training.
    - i. Field verifying field existing conditions before doing any work.
    - j. Labeling each device with its specific device address with transparent labels and red markings.
    - k. Test the complete work. Correct any deficiencies to the satisfaction of the Engineer and the Fire County.
    - l. Training on Fire Alarm System Operation.

##### 1.2 RELATED SECTIONS

- A. Documents affecting work of this Section include, but are not necessarily limited to, General Conditions, Special Conditions and Division 1 of these Contract Documents.

# EXHIBIT C

- B. Section 16010, Electrical General Provisions.
- C. Section 16050, Basic Construction Materials and Methods.

## 1.3 SYSTEM DESCRIPTION

- A. The fire alarm system shall be a complete fire protection Harrington HS3200 addressable system. The system as described shall be installed, tested, and delivered in first class condition to be a Harrington system. The system shall include, but not limited to all required control equipment, power supplies, signal initiating devices, audible and visual alarm devices, raceways, wiring and all other accessories to accomplish the requirements of this specification and the contract drawings, whether itemized or not.
- B. The fire alarm system as indicated on drawings and specified herein has been pre-approved by City and California State Fire Marshal.

## 1.4 SUBMITTALS

- A. Comply with pertinent provisions of Section 01300, Submittal Procedures.
- B. Shop Drawings: Include sufficient information, clearly presented, to determine compliance with Drawings and Specifications
  - 1. Include manufacturer's name, model numbers, California State Fire Marshal's listing numbers, ratings, power requirements, equipment layout, device arrangement, complete wiring point-to point diagrams, and conduit layouts.
  - 2. All device and equipment installation manuals and point-to-point wiring connection details.
  - 3. Show remote annunciator layout, configurations and terminations.
  - 4. Battery calculations and voltage drop calculations.
- C. Certifications: Submit certifications from major equipment manufacturer that proposed installer of installation and proposed performer of maintenance are authorized representatives of the manufacturer. Include names and address in certification.

## 1.5 OPERATION AND MAINTENANCE DATA

- A. Submit complete operating and maintenance manual listing manufacturer's name and including technical data sheets along with as-built shop drawings.
- B. Wiring diagrams shall indicate internal wiring for each item of equipment and the interconnections between items of equipment.
- C. Provide clear concise description of operation that gives detailed information required to properly operate equipment and system.

## 1.6 QUALITY ASSURANCE

- A. System shall have listing and/or approval for the following agencies as suitable for extinguishing release applications:

# EXHIBIT C

1. Underwriters Laboratories Inc.
2. California State Fire Marshal.

## 1.7 QUALIFICATIONS

- A. Manufacture: Company specializing in the manufacture of fire alarm systems with minimum 5 years documented experience, whose installations have rendered satisfactory service for minimum 2 years, and who shall provide factory trained technical support.
- B. Installer: Company specializing in the installation of fire alarm systems with minimum 2 years documented experience and meeting the following criteria:
  1. NICET level 2 or greater
  2. Located within 60-mile radius of project site.
  3. Authorized dealer of specified manufacturer employing factory trained personnel
  4. All parts of system stocked within offices.
  5. Capable of providing service response within 24 hours or less.

## 1.8 REGULATORY REQUIREMENTS

- A. The specifications and standards listed below form a part of this specification. The system shall fully comply with these standards.
- B. National Fire Protection Association (NFPA) - USA:
  1. No. 71-89 Central Station Signaling Systems
  2. No. 72-93 Protective Signaling Systems
  3. No. 72-93 Automatic Fire Detectors
  4. No. 72-93 Notification Appliances for Protective Signaling Systems.
  5. No. 72-93 Testing Procedures for Signaling Systems.
  6. No. 101-93 Life Safety Code
  7. No. 268 Smoke Detectors for Fire Protective Signaling Systems, July 20, 1987
  8. No. 864 Control Units for Fire Protective
  9. Signaling Systems, May 26, 1987
  10. No. 268A Smoke Detectors for Duct Applications.
  11. No. 521 Heat Detectors for Fire Protective
  12. No. 464 Audible Signaling Appliances.

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13. No. 38 Manually Actuated Signaling Boxes.
14. Signaling Systems.
15. No. 1971 Visual Notification Appliances.

- C. Underwriters Laboratories Inc. (UL) - USA:
- D. Local and State Building Codes
- E. All requirements of the Authority Having Jurisdiction (AHJ).

## 1.9 PROJECT/SITE CONDITIONS

- A. Detectors must be protected for dust due to construction.
  1. Detectors installed and not protected from dust shall be removed and replaced at contractor's expense.
  2. Detectors subjected to construction debris will not be accepted.
- B. Devices mounted on walls prior to final painting is not acceptable.

## 1.10 WARRANTY

- A. Fire alarm panel shall have a five- (5) year manufactures warranty from date of system acceptance.
- B. Signaling devices shall have a two- (2) year manufactures warranty from date of system acceptance.
- C. Labor shall have a two- (2) year on all fire alarm equipment
- D. Warranties shall not begin until the fire alarm system has been completely tested and inspected by the authority having jurisdiction and fire alarm system accepted by Owner.
- E. The full cost of maintenance, labor and materials that is required to correct any defect during the warranty period shall be included.
- F. System inspections per NFPA-72 1993 shall be included for the two-year warranty period.

## 1.11 COUNTY'S INSTRUCTIONS

- A. Installing contractor shall provide training of Fire alarm system by factory trained persons
  1. Provide a minimum two 2-hour on-site training sessions for Owner's staff.
  2. Provide a minimum one 4-hour on-site training session for Owner's maintenance personnel
- B. Training sessions shall provide:
  1. Instruction for operating the fire alarm system.

# EXHIBIT C

2. "Hands-on" demonstrations of the operations of all system components.
  3. Instruct Owner's maintenance personnel process of changing program and functions
- C. Provide typewritten Sequence of Operation to owner.
- D. Permanently attach Sequence of Operation for fire alarm panel on wall next to fire alarm panel.
- E. Each training session shall be minimum of 2 hours excluding traveling time.

## 1.12 MAINTENANCE

- A. Maintenance and testing shall be per NFPA-72 or as required by the authority having jurisdiction.
- B. A preventive maintenance schedule shall be provided by the fire alarm contractor that shall describe the protocol for preventive maintenance. The schedule shall include:
1. Systematic examination, adjustment and cleaning of all detectors, manual fire alarm stations, control panels, power supplies, relays, water flow switches and all accessories of the fire alarm system.
  2. Each circuit in the fire alarm system shall be tested minimum of semiannually
  3. Each smoke detector shall be tested in accordance with the requirements of NFPA-72

## PART 2 - PRODUCTS

### 2.1 CONDUIT AND WIRE

- A. Conduit:
1. Installation shall be in accordance with The National Electrical Code (NEC), local and state requirements.
  2. All Surface wiring shall be installed in Wiremold type raceway. Conduit fill shall not exceed 40 percent or interior cross sectional area where three or more cables are contained within a single conduit.
  3. Cable must be separated from any open conductors of Power, or Class 1 circuits, and shall not be placed in any conduit, junction box or raceway containing these conductors, as per NEC Article 760-29.
  4. Wiring for 24 volt control, alarm notification, emergency communication and similar power-limited auxiliary functions may be run in the same conduit as initiating and signaling line circuits. All circuits shall be provided with transient suppression devices and the system shall be designed to permit simultaneous operation of all circuits without interference or loss of signals.

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5. Raceway shall not enter the Fire Alarm Control Panel, or any other remotely mounted Control Panel equipment or back boxes, except where conduit entry is specified by the FACP manufacturer.
6. Raceway shall be ¾ inch (19.1 mm) minimum, and size accordingly.
7. Raceway shown on plans is diagramical. Actual site conditions may affect conduit routing. It is the responsibility of contractor to verify all conditions.

## B. Wire:

1. All fire alarm system wiring shall be new.
2. Wiring shall be in accordance with local, state and national codes (e.g., NEC Article 760) and as recommended by the manufacturer of the fire alarm system. Number and size of conductors shall be as recommended by the fire alarm system manufacturer, but not less than 18 AWG (1.02 mm) for Initiating Device Circuits and Signaling Line Circuits, and 14 AWG (2.05 mm) for Notification Appliance Circuits.
3. All wire and cable shall be listed and/or approved by a recognized testing agency for use with a protective signaling system.
4. Wire and cable not installed in conduit shall have a fire resistance rating suitable for the installation as indicated in NFPA 70 (e.g., FPLR).
5. Wiring used for the multiplex communication loop shall be twisted pair and a data grade cable meeting FPL ratings. Cable is to be that which is recommended by the fire alarm equipment manufacturer. The system shall permit use of IDC and NAC wiring in the same conduit with the communication loop.
6. All field wiring shall be completely supervised.
7. All underground wires and cables shall be underground and waterproof rated by the manufacturer.

## C. Terminal Boxes, Junction Boxes and Cabinets:

1. All boxes and cabinets shall be UL listed for their use and purpose.
2. Notification devices:
  - a. Devices being surface mount shall be mounted in boxes from the device manufacture.
  - b. Devices being mounted flush shall be mounted in a 4 " square box (minimum of 2-1/2 inches deep) flush with wall
3. Initiation devices:
  - a. Devices being surface mount shall be mounted in boxes from the device manufacture.
  - b. Devices being mounted flush shall be mounted in a 4" square box (minimum of 2-1/2 inches deep) flush with a one gang plaster ring.



# EXHIBIT C

4. Detectors:
  - a. Detectors mounted in areas not occupied may be surface mount to a four square box.
  - b. Detectors mounted surface in areas to be occupied shall use round wiremold boxes to fit detector base.
  - c. Detectors mounted flush shall have a 4-square box with a 4-O plaster ring.
5. Notification circuits shall be arranged to serve like categories (manual, smoke, and water flow). Mixed category circuitry shall not be permitted except on signaling line circuits connected to addressable reporting devices.

## 2.2 SYSTEM OPERATION

### A. Sequence of Operation

1. When a fire alarm condition is detected by one of the system initiating devices, the following functions shall immediately occur:
  - a. All automatic programs assigned to the alarm point shall be executed and the associated indicating devices and relays activated.
  - b. Fire alarm horn shall sound in temporal pattern.
  - c. Fire alarm strobes shall flash at the rate per code and shall synchronize if more than one strobe in one room or open area.
  - d. The System Alarm on appropriate panel will indicate an alert condition.
  - e. Activate all control by event functions related to the alarm.
  - f. The municipal fire department to be signaled automatically.
  - g. Fan systems, i.e. shutdown, exhaust and pressurization operations to be initiated.
  - h. Doors with hold open devices shall be signaled to release.
  - i. Recall elevator to designated floor level.
  - j. When a troubled condition is detected by one of the system initiating or indicating circuits, the following functions shall immediately occur:
    1. System Trouble will be indicated on the panel and system annunciator(s).
    2. A local trouble-sounding device in the panel and annunciator shall be activated. This sound shall be distinct from the alarm sound.

# EXHIBIT C

- k. The appropriate message will appear on the LCD display.
- l. See fire alarm drawings for other requirement and sequence of operation.

## B. Power Supply

1. The power supply for the panel and all fire alarm peripherals shall be integral to the control panel. The power supply provides all control panel and peripheral power needs.
2. Positive-temperature-coefficient (thermistors), circuit breakers, or other over-current protection shall be provided on all power outputs.
3. Input power shall be 120 VAC 60 Hz. The power supply shall provide internal batteries and charger. Internal battery capacity shall be sized as required to meet ULC requirements.
4. The Main Power Supply shall provide a battery charging circuit consisting of a fully automatic standby charger, rate compensated, capable of maintaining battery in fully charged state and be capable of recharging batteries to 70% of alarm capacity within 12 hours. Provide for normal operation of entire system for 24 hours with power remaining to sound alarms for 5 minutes.
5. Provide charger with following supervised functions; circuit protection for shorts, open disconnected or reversed polarity battery connection, supervision or protection of high or low voltage, overcharging and charger failure. Automatic load shedding or battery disconnects on deep discharge to prevent battery damage.
6. Batteries 24 V, rechargeable, gelled electrolyte, totally sealed, fully charged with all interconnections ready for service. Maintenance free, long -life

## C. Addressable Devices

1. Addressable Detectors
  - a. All addressable detectors shall:
    1. Provide a test means whereby they will simulate an alarm condition and report that condition to the control panel. Such a test may be initiated at the detector itself, by activating a magnetic switch, or may be activated remotely on command from the control panel.
    2. Provide address-setting means on the detector head using rotary decimal switches. The detectors shall also store an Internal identifying code, which the control panel shall use to identify the type of detector.
    3. Provide dual alarm and power LED's. Both LED's shall flash under normal conditions, indicating that the detector is operational and in regular communication with the control panel. Both LED's may be placed into steady illumination by the control panel, indicating that and alarm

# EXHIBIT C

condition had been detected. An output connection shall also be provided in the base to connect an external remote alarm LED.

4. Include a twist-lock base.
  5. Is ceiling mounted.
- b. Addressable Photoelectric Smoke Detectors shall connect with two wires to one of the control addressable input circuits. The detectors shall use the photoelectric principal to measure smoke density and shall, on command from the control panel send data to the panel representing the analog level of smoke density.
  - c. Addressable Ionization Detectors shall connect with two wires to one of the control addressable input circuits. The detectors shall use the dual-chamber Ionization principal to measure products of combustion and shall, on command from the control panel, send data to the panel representing the analog level of products of combustion.
  - d. Thermal Detectors with monitor module shall connect with two wires to one of the control panel addressable input circuit. The detectors shall use an electronic sensor to measure temperature levels in its chamber and shall, on command from the control panel, send data to the panel representing the analog temperature level.
2. Monitor Module
    - a. The Monitor module shall be used to connect a supervised zone of conventional initiating devices (any N.O. dry contact device, including 4-wire smoke detectors) to an addressable input circuit. The Monitor Module shall mount in a 4-inch square, 2-1/8" deep electrical box. The zone shall be wired class B.
    - b. The Monitor module shall provide address-setting means using rotary decimal switches and shall also store an internal identifying code, which the control panel shall use to identify the type of device. An LED shall be provided which shall flash under normal conditions, indicating that the Monitor module is operational and in regular communication with the control panel.
  3. Isolator Module
    - a. The Isolator Module shall be used to isolate wire to wire short circuits on a loop and to limit the number of other modules or detectors that are incapacitated by the short circuit fault. Isolator modules should be placed between every 25 or less devices. Isolator modules are not shown on drawings, contractor shall design, provide and connect. Locate isolator modules at readily accessible space or area. If a wire to wire short occurs, the isolators shall automatically open-circuit. When a short is corrected, the isolators shall automatically reconnect the isolated section of the loop.

# EXHIBIT C

- b. The Isolator module shall not require any address setting, although each isolator module will electrically reduce the capacity of the loop by two detector or module addresses.
- c. The Isolator module will be mounted in a standard 4-inch square, 2-1/8" deep electrical box. It shall provide a single LED, which shall flash to indicate that the Isolator is operational and shall illuminate steadily to indicate that a short has been detected and isolated.
- 4. Synchronization Module:
  - a. Provide strobe synchronization module to synchronize strobes if more than one strobe in one room or open area.
- D. Batteries
  - 1. Shall be 12 volt, Gel-Cell type (two required).
  - 2. Battery shall have sufficient capacity to power the fire alarm system for not less than twenty-four hours plus 5 minutes of alarm upon a normal AC power failure.
  - 3. The batteries are to be completely maintenance free. No liquids are required. Fluid level checks, refilling, spills and leakage shall not be required.

## 2.3 FIRE ALARM EQUIPMENT

- A. Fire Alarm Control Panel
  - 1. The fire alarm control panel shall be a Harrington Signal HS-3200 addressable panel and shall include, but not limited to the hardware, software and firmware required for a fully functionally fire alarm system.
- B. Addressable Devices, modules
  - 1. Mini Monitor Module M501M, or equal
  - 2. Monitor Module M500M, or equal
  - 3. Control Module M500R, or equal
  - 4. Isolator Module M500X, or equal
- C. Addressable Devices, Detectors
  - 1. Addressable Photoelectric Smoke Detector 2251B, or equal
  - 2. Heat sensor 602, or equal
  - 3. 6" base for Addressable Detectors B210LP, or equal
  - 4. Intelligent Air duct Photoelectric smoke detector housing DH200PL, or equal
- D. Pull Stations (must be ADA approved, and must comply with CBC 1117 B.6.4.)

# EXHIBIT C

1. Non-Coded manual pull station Commercial Products Group MMPS, or equal
  - a. For locations requiring the pull station to be surface mounted use A-147BB back box.
  - b. For Locations requiring the pull station to be flush mounted use a 4" square box (minimum 1-1/2" deep) with a single gang plaster ring sized as required by code.
- E. Audible Devices (Indicating Appliances)
  1. 4" Electronic-Mechanical Horn Wheelock AH-24WP series, or equal, and has Temporal audible pattern.
  2. Exterior Box, WPBB
- F. Audio-Visual Devices
  1. 4" Electro-Mechanical Horn with Strobe (Candela as required) Wheelock AS-24MCW series for indoor and Wheelock AS-24WP series for outdoor installation or equal, and shall be ADA compliant.
  2. Exterior Box, WPPR.
- G. Visual Devices
  1. Visual signaling device (Candela as Required) Wheelock RSS-24MCW series, or equal, and shall be ADA compliant.
- H. Substitutions: No substitutions permitted.

## **PART 3 - EXECUTION**

### 3.1 EXAMINATION

- A. Verify that electrical components specified under Section 16010, Basic Construction Materials and Methods have been installed and are properly located and secured.
- B. Electrical components match those of the fire alarm devices
- C. Do not begin installation until unsatisfactory conditions have been corrected.

### 3.2 INSTALLATION

- A. Install fire alarm system in accordance with manufacture's instructions and final reviewed shop drawings.

### 3.3 TESTING AND ACCEPTANCE

- A. At final inspection, manufacturer's representative shall demonstrate that system functions properly in every respect.
- B. Project Inspector, Architect and key Owner Personnel shall witness final test of the system.

# EXHIBIT C

- C. NFPA inspection and testing form (NFPA 72 7-5.1 or latest version) shall be filled out completely and signed by those performing and witnessing the final test.
- D. The original copy shall be delivered to the Project inspector. Copies of the original shall be made and delivered to the Contractor and Architect.
- E. Audible test must be performed at time of inspections.
  - 1. Must be 15dB above ambient noise.
  - 2. Minimum dB level 60Db
- F. Fire alarm contractor shall provide a “record of completion” to the inspector of record (IOR) after completion of operational acceptance tests.
- G. Provide Owner the programming access secret codes and other security codes.

**END OF SECTION**



## NAPA VALLEY TRANSPORTATION AUTHORITY COVER MEMO

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### **SUBJECT**

Consultant Support Contract for the Soscol Gateway Transit Center Tenant Improvements Project

### **STAFF RECOMMENDATION**

That the Napa Valley Transportation Authority (NVTA) Board authorize the Executive Director to execute and make minor modifications to Project Work Order No. 23-OCE12-E07 with TYLin (Attachment 1) for Construction Management and Inspection Services for the Soscol Gateway Transit Center Tenant Improvements project in an amount not to exceed \$199,000.

### **EXECUTIVE SUMMARY**

Construction of the Soscol Gateway Transit Center Tenant Improvements project is scheduled to begin in Winter 2025, with completion anticipated by May 2025. To ensure quality and adherence to contract standards, NVTA staff recommends issuing a task order to TYLin for construction management and inspection (CM&I) services. The construction manager would oversee the construction awarded to Carr's Construction Service, Inc. entailing construction of new offices, meeting spaces, and enhanced facilities on the first floor, as well as sound attenuation on the second floor.

### **FISCAL IMPACT**

Yes. The cost of construction management and inspection services and design services during construction for this project totals \$199,000. These project costs will be funded by Transportation Development Act 3 (TDA3) funds.



## NAPA VALLEY TRANSPORTATION AUTHORITY

### Board Agenda Memo

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**TO:** NVTA Board of Directors  
**FROM:** Kate Miller, Executive Director  
**REPORT BY:** Grant Bailey, Program Manager – Engineer  
(707) 259-5951 / Email: [gbailey@nvta.ca.gov](mailto:gbailey@nvta.ca.gov)  
**SUBJECT:** Consultant Support Contract for the Soscol Gateway Transit Center  
Tenant Improvements Project

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#### **RECOMMENDATION**

That the Napa Valley Transportation Authority (NVTA) Board authorize the Executive Director to execute and make minor modifications to Project Work Order No. 23-OCE12-E07 with TYLin (Attachment 1) for Construction Management and Inspection Services for the Soscol Gateway Transit Center Tenant Improvements project in an amount not to exceed \$199,000.

#### **COMMITTEE RECOMMENDATION**

None

#### **BACKGROUND**

Pending the awarding the construction contract, the Soscol Gateway Transit Center Tenant Improvements project is scheduled to being in Winter 2025. To ensure this project is built to contract requirements and meets quality standards construction management and inspection (CM&I) will be required for oversight of construction contract activities. NVTA staff recommends issuing a task order to TYLin, NVTA's on-call architectural and engineering consultant, for these services.

The successful bid for construction was awarded to Carr Construction and the project will entail:

**First Floor:** Two offices, a meeting space, wellness room, restroom with toilet, shower, and changing area as well as an expansion of the bus driver break room.



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**Second Floor:** Sound attenuation treatments in the open cubicle areas and new pod meeting room.

Completion of the project is expected by May 2025.

In early 2024, TYLin was selected as NVTA's on-call architectural and engineering consultant through a competitive request for proposals process under NVTA's master on-call consultant bench. As part of this role, TYLin has provided a proposal to supply CM&I services for this project. Staff recommends the Board approve a project work order with TYLin for CM&I services for the Soscol Gateway Transit Center Tenant Improvements project.

### **ALTERNATIVES**

Defer the construction management and inspection until a later date and risk not having sufficient project management and expertise to manage the construction of the project. This would likely result in delays to project construction, and potentially increase the overall cost of the project.

### **STRATEGIC GOALS MET BY THIS PROPOSAL**

Goal 3: Use taxpayer dollars efficiently.

Hiring consultants for a short term with expertise in a variety of fields is more economical than hiring full time employees with the qualifications needed to manage the construction of capital projects.

### **ATTACHMENTS**

(1) Project Work Order No. 23-OCE12-E07 with TYLin

**PROJECT WORK ORDER NO. 23-OCE12-E07  
ON-CALL A/E & PROJECT DELIVERY SERVICES**

**PROJECT NAME:**           **CONSULTANT CONSTRUCTION MANAGEMENT – SGTC  
IMPROVEMENTS**

**PROJECT MANAGER:**   Grant Bailey, Program Manager, Engineer -  
E [gbailey@nvta.ca.gov](mailto:gbailey@nvta.ca.gov) | T 707.259.5951

**CONSULTANT DESIGNATED TEAM MEMBERS:**

- T.Y. Lin International Cost Proposal and Resource Summary – EXHIBIT B

*Consultant will independently and at its own discretion and liability enter into agreement with sub-consultant(s) listed in their proposal for any services required to complete the project as described in the scope of work.*

**SCOPE OF SERVICE:** Provide general construction management and inspection support as described in the scope of services attached hereto as EXHIBIT A.

**START DATE:**    *DECEMBER 2024*                   **COMPLETION DATE:** *AUGUST 2025*

**NOT-TO-EXCEED AMOUNT FOR THIS PROJECT:** \$199,000

**CHARGE NUMBER FOR PAYMENT:** \_\_\_\_\_

**TERMS AND CONDITIONS:** This Project Task Order is issued and entered into as of the last date written below in accordance with the terms and conditions set forth in the Master Agreement (23-OCE12) with T.Y. Lin International, which terms and conditions are hereby incorporated and made part of this Project Task Order.

**NVTA**

By: \_\_\_\_\_  
KATE MILLER, Executive Director

**CONSULTANT  
T.Y. Lin International**

By: \_\_\_\_\_  
MICHAEL PYRZ, PE  
Principal-in-Charge

Approved as to Form	
By:	_____
	NVTA General Counsel
Date:	_____

# EXHIBIT A

## NVTA Soscol Gateway Transit Center Building Modifications

### **Project Description:**

At the conclusion of the COVID-19 lock-down, staff transitioned back to the office while still utilizing virtual meeting platforms to participate in planning, project, policy, and funding meetings. This has resulted in increased noise levels, which undermines the ability of other staff to concentrate on work, communicate with co-workers, and participate in meetings. The proposed changes are intended to improve the office environment to compliment the new ways in which we work. The improvements are to provide noise attenuation at the facility and some new office space. The architect is Moniz Architecture in Sacramento.

First Floor – Design two (2) offices, a meeting space, wellness room, restroom with toilet, shower, and changing area and expand the bus driver break room.

Second Floor – Sound attenuation for open cubicle through the installation of minimally invasive acoustical treatment as well as two small modular meeting rooms.

95% Plans and specifications included in this scope of work.

### **Scope of Work:**

TYLin will provide general construction management and inspection support as hi-lighted below:

- Coordination with NVTA, Contractor, inspectors, designers, utility companies, adjacent property owners.
- Supervise, coordinate and monitor construction services
- Progress meetings & meeting minutes
- Document Controls
- Monitor Construction budget
- Monitor Construction Schedule
- Evaluate contractor bids
- Review Inspector's Daily Construction Reports
- Review change order claims & draft responses
- Final Inspection & Prepare final acceptance document

Our sub-consultant Alpha CM will be performing the inspections and construction management as hi-lighted below:

- Construction Management Oversight and coordination
- Pre-construction conference (meeting agenda & minutes)
- Maintain Logs for RFIs, submittals, Plan clarifications, claims, change orders, etc.
- Monitor review of shop drawings & material samples
- Prepare weekly & monthly progress reports

## NVTA Soscol Gateway Transit Center Building Modifications

- Review Inspector's Daily Construction Reports
- Review/Prepare Weekly Statement of Working Days
- Review change order claims & draft responses
- Materials Testing
- Maintain project records
- Prepare, review and process progress and final payments
- Project Closeout documentation and coordination
- Inspection Oversight and coordination
- Review plans and specifications
- Review approved shop drawings, material samples, & other items submitted by Contractor
- Prepare daily inspection reports
- Record work progress
- Final Inspection & Prepare final acceptance document
- Prepare punch list

A full description of Alpha CM's scope is included as Attachment A.

Our sub-consultant Forsythe Engineering will be performing special inspections related to Concrete Reinforcing, Concrete Placement, Shear Wall/HDs and Epoxy Anchors.

### **Schedule:**

The project will have a roughly four-month construction duration with about 10 weeks of that duration involving full-time construction activities.

## Construction Management Tasks

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### 1. General

- a. Be a licensed architect, registered professional engineer, or licensed general contractor.
- b. Be the primary point of contact and responsible for the contract administration, construction engineering, and engineering integrity of the project. The CM shall verify Contractor complies with the requirements of the contract documents.
- c. Report directly to NVTA Engineer and act as a liaison between NVTA and all project stakeholders in order to accomplish the full project services intended by NVTA.

### 2. Project Coordination and Correspondence During Construction

- a. Oversee and verify that the specific project's scope of services is completed in a timely and professional manner with an emphasis on providing NVTA with a high-quality project.
- b. Coordinate project activities with Contractor, NVTA staff, consultant inspector, special inspector, designer, utility companies, and other parties as required.
- c. Provide, manage, coordinate, and ensure timely completion/approvals in response to all Requests for Information (RFI), shop drawings, product data samples, submittals, and Change Orders.
- d. Make a record of disputes and potential change orders.
- e. Receive, process and distribute all Contractor correspondence. Coordinate with NVTA (and other applicable parties as necessary) to develop, prepare and transmit responses.
- f. Maintain logs of requests for information, submittals, plan clarifications, claims, proposed change orders, final change orders. Maintain all documents generated for the project including daily reports, requests for information, submittals, transmittals, O & M Manuals, warranties, etc. Ensure NVTA Staff receive copies of these documents.
- g. Establish and maintain project controls and provide administrative, management, and related services necessary to coordinate the work of the Contractor and all subcontractors in order to facilitate timely completion of the project in accordance with contract documents and NVTA objectives.
- h. Review and recommend approval of Contractor's monthly progress report and payment request.
- i. Provide status updates to NVTA on significant issues as they arise.
- j. Provide any contract administration documentation required by NVTA, State, or Federal authorities.
- k. Lead pre-construction conference with the Contractor and stakeholders including preparation of meeting agenda and minutes; and distribute to applicable entities (not just attendees).
- l. Lead progress meetings (regularly scheduled or otherwise) with Contractor and NVTA staff. Prepare agenda and minutes.
- m. Verify that certified payrolls are submitted and logged.
- n. Coordinate and schedule materials testing and special inspection services.
- o. Ty Lin will contract with materials testing and special inspection subconsultant(s).
- p. Coordinate testing and startup including efforts by Contractor, manufacturers, and NVTA staff.

### 3. Reporting

- a. Prepare short (1 page) weekly progress reports including a list of key items of work completed during the week and expected work the following week. Include approximately 2 photos. Submit to NVTA by Monday 9:00 am the following week. Weekly reports may be posted to NVTA's public website.
- b. Prepare and submit a monthly progress report describing key issues, status of schedule, budget, payments, RFIs, submittals, claims, potential change orders, and change orders. The monthly progress report shall be due to NVTA Engineer on the tenth (10th) of every month.
- c. Review Inspector's daily construction reports and suggest edits where applicable. Initial (to show that document was reviewed and approved) and submit copies of previous week's daily reports to NVTA by Monday 9:00 am the following week.

- d. Review/Prepare Weekly Statement of Working Days and submit to NVTA for review by Monday morning at 9:00 a.m. the following week.
- e. Complete all documentation and coordination required for final acceptance and closeout of construction contracts.

#### **4 Submittal Management**

- a. Receive, date, stamp, and log submittals, and distribute for review by the design team.
- b. Monitor review of submittals to foster timely review and return of submittals to Contractor.
- c. Review administrative submittals for conformance with Contract plans and specifications requirements.
- d. Transcribe reviewer's comments and distribute to project team.
- e. Ensure all reviewed submittals are returned to Contractor.

#### **5. Change Order and Claims Management**

- a. Analyze requested change orders for validity, cost, and schedule impacts. Provide information to NVTA Engineer necessary to review the requested change order. NVTA Engineer shall be responsible for the consideration, negotiation and resolution of all requests for change orders. At the request of NVTA Engineer, draft and forward proposed change orders to NVTA Engineer.
- b. Analyze claims for validity, cost, and schedule impacts. Provide information to NVTA Engineer necessary to review and resolve the claim. NVTA Engineer shall be responsible for the consideration, negotiation and resolution of all claims. If requested by NVTA Engineer, Consultant shall draft responses to claims for review and approval by NVTA Engineer. NVTA staff will obtain final signatures and distribute responses to claims.

### **Inspection Tasks**

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- ◆ Observe and verify contractor compliance with the plans, specifications, and other contractual requirements throughout the course of the work.
- ◆ Review the plans and specifications prior to the start of construction.
- ◆ Review shop drawings, materials samples, schedules, and other items submitted by the contractor and approved by the Engineer of Record for comparison to the work and materials used in the field.
- ◆ Prepare daily inspection reports (daily and other).
- ◆ Maintain contact with adjacent property owners and others affected.
- ◆ Promptly advise higher authorities regarding any schedule or other progress problems or variances from the contract requirements.
- ◆ Coordinate and monitor completion of review and approval of submittal and testing required under the contract.
- ◆ Follow the Contractor's health and safety plan as they are responsible for site safety.
- ◆ Reject work which does not comply with contract requirements.
- ◆ Advise the contractor of deficiencies requiring correction.
- ◆ Advise higher authority when basic contractual commitments are not being met and/or continued work will be substandard; recommend or issue stop work orders as provided in agency/owner policy or regulations.
- ◆ Record work progress and other relevant data on the site drawing set.
- ◆ Prepare and/or assist in preparation of final acceptance documents.
- ◆ Arrange and conduct the final inspection and prepare the punch list and monitor completion or correction of items on the List.

# EXHIBIT B

NVTA Construction Management and Inspection for Soscol Gateway Transit Center  
Cost Proposal

## Summary Breakdown of Costs

**CONTRACT NUMBER:**

**PROJECT NAME: NVTA Soscol Gateway Transit Center Building Modifications**

Total Non-Contingency Hours	788
Total Non-Contingency Labor Costs	\$ 161,544
Total Non-Contingency Direct Expenses	\$ 3,060
Total Non-Contingency Costs	\$ 164,604
Total Non-Contingency Profit	\$ 16,154
<b>Total Non-Contingency Cost + Profit</b>	<b>\$ 180,758</b>
Contingency (10%)	\$ 18,075.84

<b>Total Contingency Cost + Profit</b>	<b>\$ 198,834.27</b>
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### **COST PROPOSAL ASSUMPTIONS:**

1. Construction phase level of effort is based on 9 hrs/day for 10 weeks and 4hrs/ day for 4 weeks, to cover full scope of work.
2. Cost proposal is firm for a 90-day period from proposal submission deadline.
3. Work conducted standard work hours M-F. No weekends or holiday hours calculated into level of effort.
4. Level of effort is an estimate only.
5. Each individual cost item is a guide only. Total CM costs shall take precedent.

NVRTA Construction Management and Inspection for Soscol Gateway Transit Center  
Cost Proposal

Task Resource Summary		IV	T	AK	BA	
		Certifications*:		TYLI	Alpha CM	Forsythe
Task		Total Hours	Hours	Hours	Hours	Hours
1	General Construction Management & Inspecti	271	90	181	0	
3	Soscol Gateway Transit Center Building Modif	179	12	167	0	
5	Soscol Gateway Transit Center Building Modif	338	8	330	0	
6	0	0	0	0	0	
7	0	0	0	0	0	
8	0	0	0	0	0	
9	0	0	0	0	0	
10	0	0	0	0	0	
<b>0</b>	<b>TOTAL Tasks/Deliverables</b>	<b>788</b>	<b>110</b>	<b>678</b>	<b>0</b>	
O1	0	0	0	0	0	
O2	0	0	0	0	0	
O3	0	0	0	0	0	
<b>0</b>	<b>TOTAL Optional Tasks/Deliverables</b>	<b>0</b>	<b>0</b>	<b>0</b>	<b>0</b>	
<b>GRAND TOTAL</b>		<b>788</b>	<b>110</b>	<b>678</b>	<b>0</b>	
Percentage of Total Contract:		100.00%	13.96%	86.04%	0.00%	

Task Fee Summary						
		Certifications*:		TYLI	Alpha CM	Forsythe
Task		Total Fee	Fee	Fee	Fee	Fee
1	General Construction Management & Inspecti	\$ 62,017	\$ 22,736	\$ 39,281	\$ -	
3	Soscol Gateway Transit Center Building Modif	\$ 42,505	\$ 3,244	\$ 36,201	\$ 3,060	
5	Soscol Gateway Transit Center Building Modif	\$ 76,236	\$ 2,162	\$ 74,074	\$ -	
6	0	\$ -	\$ -	\$ -	\$ -	
7	0	\$ -	\$ -	\$ -	\$ -	
8	0	\$ -	\$ -	\$ -	\$ -	
9	0	\$ -	\$ -	\$ -	\$ -	
10	0	\$ -	\$ -	\$ -	\$ -	



NVTA Construction Management and Inspection for Soscol Gateway Transit Center  
Cost Proposal

<b>0</b>	<b>TOTAL Tasks/Deliverables</b>	<b>\$ 180,758</b>	<b>\$ 28,142</b>	<b>\$ 149,556</b>	<b>\$ 3,060</b>
O1	0	\$ -	\$ -	\$ -	\$ -
O2	0	\$ -	\$ -	\$ -	\$ -
O3	0	\$ -	\$ -	\$ -	\$ -
<b>0</b>	<b>TOTAL Optional Tasks/Deliverables</b>	<b>\$ -</b>	<b>\$ -</b>	<b>\$ -</b>	<b>\$ -</b>
<b>NO CONTINGENCY GRAND TOTAL</b>		<b>\$ 180,758</b>	<b>\$ 28,142</b>	<b>\$ 149,556</b>	<b>\$ 3,060</b>
<b>GRAND TOTAL WITH 10% CONTINGENCY</b>		<b>\$ 198,834</b>	<b>\$ 30,957</b>	<b>\$ 164,512</b>	
Percentage of Total Contract:		100.00%	15.57%	82.74%	1.69%



## NAPA VALLEY TRANSPORTATION AUTHORITY COVER MEMO

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### **SUBJECT**

On-Call Task Orders with TYLin

### **STAFF RECOMMENDATION**

That the Napa Valley Transportation Authority (NVTA) Board authorize the Executive Director to execute and make minor modifications to:

1. Amendment No. 1 to Project Work Order No. 23-OCE12-E01 with TYLin (Attachment 1) for technical support with transit signal priority (TSP) equipment on the State Route (SR) 29 corridor, increasing the contract value by \$55,792 for a total amount not to exceed \$100,000; and
2. Amendment No. 1 to Project Work Order No. 23-OCE12-E02 with TYLin (Attachment 2) for engineering staff support services, increasing the contract value by \$130,370 for a total amount not to exceed \$200,000.

### **EXECUTIVE SUMMARY**

In early 2024, TYLin was chosen as NVTA's on-call architectural and engineering consultant, delivering services such as construction management and design for infrastructure projects under NVTA's on-call consultant program. Two task orders were issued in May 2024 for TYLin to support transit signal priority (TSP) implementation along the SR29 corridor and to provide engineering staff augmentation. Both task orders have since reached their funding limits. Staff recommends the Board approve amendments adding funds to allow work to continue work. The proposed amendments will enable further TSP data analysis for improved transit efficiency and maintain critical engineering support for NVTA's ongoing projects.

### **FISCAL IMPACT**

Yes. Work Order 23-OCE12-01 Amendment 1 increases contract value by \$55,792 and Work Order 23-OCE12-02 Amendment 1 increases contract value by \$130,370, for a total cost of \$186,162. These project costs will be funded by Regional Measure 3 Funds.



## NAPA VALLEY TRANSPORTATION AUTHORITY Board Agenda Memo

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**TO:** NVTA Board of Directors  
**FROM:** Kate Miller, Executive Director  
**REPORT BY:** Grant Bailey, Program Manager – Engineer  
(707) 259-5951 / Email: [gbailey@nvta.ca.gov](mailto:gbailey@nvta.ca.gov)  
**SUBJECT:** On-Call Task Orders with TYLin

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### **RECOMMENDATION**

That the Napa Valley Transportation Authority (NVTA) Board authorize the Executive Director to execute and make minor modifications to:

1. Amendment No. 1 to Project Work Order No. 23-OCE12-E01 with TYLin (Attachment 1) for technical support with transit signal priority (TSP) equipment on the State Route (SR) 29 corridor, increasing the contract value by \$55,792 for a total amount not to exceed \$100,000; and
2. Amendment No. 1 to Project Work Order No. 23-OCE12-E02 with TYLin (Attachment 2) for engineering staff support services, increasing the contract value by \$130,370 for a total amount not to exceed \$200,000.

### **COMMITTEE RECOMMENDATION**

None

### **BACKGROUND**

In early 2024, TYLin was selected as NVTA's on-call architectural and engineering consultant through a competitive request for proposals process under NVTA's master on-call consultant bench. Under various task orders, TYLin has provided NVTA with engineering-related services including construction management, design of park and ride and electric vehicle charging station infrastructure and claim preparation support.

In May 2024, two task orders were issued under the Executive Director's signature authority for TSP program implementation and engineering staff augmentation. TYLin has

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since depleted the budget of each task order, and staff recommends the Board authorize two amendments to increase task order funding to allow work to continue.

TYLin was awarded Task Order 23-OCT-1201 to provide engineering support for deploying a TSP network on eight NVTA transit vehicles and five signalized intersections along the SR29 corridor in American Canyon. TYLin has assisted NVTA in establishing standard operating procedures for long-term maintenance tasks associated with the program, troubleshooting the initial deployment, analyzing initial data outputs, and identifying upgrades for cloud connectivity. Through these efforts, the baseline TSP program and monitoring protocol have been established. If the Board approves this amendment, NVTA and TYLin will continue to analyze TSP data to improve Vine Transit system efficiency and identify additional opportunities within the existing transit network for TSP module deployment.

TYLin was awarded order 23-OCE12-02 to provide NVTA's engineering division with consultant resources for tasks such as providing quality assurance review of engineering documents, permit and utility application preparation, drafting, and general management of the NVTA on-call program. To date, TYLin has provided services under this task order that include project management, request for proposal development, permit application assistance, and Caltrans coordination for the Airport/SR29/SR12 interchange project.

Funding under both task orders have been exhausted, and staff recommends the Board authorize the Executive Director to execute these amendments for TSP technical support and engineering staff augmentation.

### **ALTERNATIVES**

The Board could decline to approve one or both task order amendments. Although the TSP system is currently functional, without the amendment for technical support, data analysis will shift to NVTA staff, which will likely slow system optimization. If the amendment for engineering staff augmentation is not approved, project delivery timelines may be extended, and overall division productivity reduced.

### **STRATEGIC GOALS MET BY THIS PROPOSAL**

Goal 3: Use taxpayer dollars efficiently.

Hiring consultants for a short term with expertise in a variety of fields is more economical than hiring full time employees with the qualifications needed to manage the construction of capital projects.

### **ATTACHMENTS**

- (1) Amendment No. 1 to Project Work Order No. 23-OCE12-E01 with TYLin
- (2) Amendment No. 1 to Project Work Order No. 23-OCE12-E02 with TYLin

**PROJECT WORK ORDER**  
**NO. 23-OCE12-E01**  
**ON-CALL A/E & PROJECT DELIVERY SERVICES**

**AMENDMENT NO. 01**

**PROJECT NAME:** STATE ROUTE 29 CORRIDOR TRANSIT SIGNAL PRIORITY (TSP)

**PROJECT MANAGER:** Grant Bailey, PE, Program Manager – Engineer  
E [gbailey@nvta.ca.gov](mailto:gbailey@nvta.ca.gov) | T 707.259.5951

**CONSULTANT DESIGNATED TEAM MEMBERS:**

- T.Y. Lin International Staff

**SCOPE OF WORK:** Provide technical support for TSP equipment on the SR 29 corridor in accordance with the Scope of Work, Exhibit

- **WHEREAS NVTA REQUIRES ADDITIONAL SERVICES TO BE PERFORMED BY THE CONTRACTOR UNDER EXHIBIT A, SCOPE OF SERVICES; AND**
- **WHEREAS CONTRACTOR IS ABLE TO PROVIDE THE DESCRIBED SERVICES AT AN ADDITIONAL COST TO NVTA IN THE AMOUNT OF \$55,792 AS PER COST PROPOSAL ATTACHED IN EXHIBIT B, INCREASING THE TOTAL WORK ORDER NTE AMOUNT TO \$100,000; AND**
- **WHEREAS NVTA WILL NEED TO EXTEND THE TERM DATE TO DECEMBER 31, 2025, TO ACCOMMODATE ADDITIONAL SERVICE PERFORMANCE TO COMPLETE THE PROJECT.**
- **WITH THE EXCEPTION OF THE ABOVE ALL TERMS AND CONDITIONS AS AGREED TO IN THE PROJECT WORK ORDER REMAIN IN FULL FORCE AND EFFECT.**

**OLD TERM END DATE:** DECEMBER 31, 2024

**NEW TERM END DATE:** DECEMBER 31, 2025

**NOT-TO-EXCEED AMOUNT FOR THIS PROJECT:** \$100,000

**CHARGE NUMBER FOR PAYMENT:** Federal

**TERMS AND CONDITIONS:** This Project Work Order is issued and entered into as of the last date written below in accordance with the terms and conditions set forth in the Master Agreement (23-OCE12) with CONTRACTOR, which terms are hereby incorporated and made part of this Project Work Order.

**NVTA**

By: \_\_\_\_\_  
KATE MILLER, Executive Director

**CONSULTANT**

T.Y. Lin International

By: \_\_\_\_\_  
MICHAEL PYRZ, PE  
Principal-in-Charge

Approved as to Form	
By:	_____
	NVTA General Counsel
Date:	_____



November 7, 2024

Napa Valley Transportation Authority  
Attn: Grant Bailey, PE  
625 Burnell Street  
Napa, CA 94559

**Subject:** Project Work Order No. 23-OCE12-E01: On-Call A/E & Project Delivery Services  
State Route 29 Corridor Transit Signal Priority (TSP) Budget Increase Request

Dear Mr. Bailey,

TYLin is requesting an extension of the *Project Work Order No. 23-OCE12-E01: On-Call A/E & Project Delivery Services – State Route 29 Corridor Transit Signal Priority* contract by six (6) months to June 30, 2025 and to increase the task order budget by \$55,792.

TYLin's scope of work would be to conduct additional analyses on TSP data collected to ensure there are no additional issues with the hardware and system. TYLin will also continue to ensure the ongoing maintenance, coordination, and optimization of the TSP hardware and system by developing standard operating procedures.

Should you require any additional information, please do not hesitate to contact me or my Deputy Project Manager, Eva Cheung. I can be reached by phone at (510) 457-3044 or by email at [john.kenyon@tylin.com](mailto:john.kenyon@tylin.com). Eva Cheung can be reached at (510) 457-3034 or [eva.cheung@tylin.com](mailto:eva.cheung@tylin.com).

Respectfully,

**TYLin**

John D. Kenyon  
Associate Vice President

CC: Michael Pyrz/TYLin; file

**AMENDMENT NO. 01**

**PROJECT WORK ORDER  
NO. 23-OCE12-E02  
ON-CALL A/E & PROJECT DELIVERY SERVICES**

**PROJECT NAME: ON-CALL STAFF AUGMENTATION**

**PROJECT MANAGER:** Grant Bailey, PE, Program Manager – Engineer  
E [gbailey@nvta.ca.gov](mailto:gbailey@nvta.ca.gov) | T 707.259.5951

**CONSULTANT DESIGNATED TEAM MEMBERS:**

- T.Y. Lin International Staff

**SCOPE OF WORK:** Provide engineering staff support services during the SGTC building modification, as described in the Scope of Work, Exhibit A.

- **WHEREAS NVTA REQUIRES ADDITIONAL SERVICES TO BE PERFORMED BY THE CONTRACTOR UNDER EXHIBIT A, SCOPE OF SERVICES; AND**
- **WHEREAS CONTRACTOR IS ABLE TO PROVIDE THE DESCRIBED SERVICES AT AN ADDITIONAL COST TO NVTA IN THE AMOUNT OF \$130,370 AS PER COST PROPOSAL ATTACHED IN EXHIBIT B, INCREASING THE TOTAL WORK ORDER NTE AMOUNT TO \$200,000; AND**
- **WHEREAS NVTA WILL NEED TO EXTEND THE TERM DATE TO DECEMBER 31, 2025, TO ACCOMMODATE ADDITIONAL SERVICE PERFORMANCE TO COMPLETE THE PROJECT.**
- **WITH THE EXCEPTION OF THE ABOVE ALL TERMS AND CONDITIONS AS AGREED TO IN THE PROJECT WORK ORDER REMAIN IN FULL FORCE AND EFFECT.**

**OLD TERM END DATE:** DECEMBER 31, 2024

**NEW TERM END DATE:** DECEMBER 31, 2025

**NOT-TO-EXCEED AMOUNT FOR THIS PROJECT:** \$200,000

**CHARGE NUMBER FOR PAYMENT:** CMA/OBAG/TDA

**TERMS AND CONDITIONS:** This Project Work Order is issued and entered into as of the last date written below in accordance with the terms and conditions set forth in the Master Agreement (23-OCE12) with CONTRACTOR, which terms are hereby incorporated and made part of this Project Work Order.

**NVTA**

By: \_\_\_\_\_  
KATE MILLER, Executive Director

**CONSULTANT**  
T.Y. Lin International

By: \_\_\_\_\_  
MICHAEL PYRZ, PE  
Principal-in-Charge

Approved as to Form	
By:	_____
	NVTA General Counsel
Date:	_____



November 7, 2024

Napa Valley Transportation Authority  
Attn: Grant Bailey, PE  
625 Burnell Street  
Napa, CA 94559

**Subject:** Project Work Order No. 23-OCE12-E02: On-Call A/E & Project Delivery Services  
On-Call Staff Augmentation Budget Increase Request

Dear Mr. Bailey,

In order to continue providing NVRTA project management support services through 2025, TYLin would like to request a budget increase of \$130,370 for Project Work Order No. 23-OCE12-E02: On-Call A/E & Project Delivery Services On-Call Staff Augmentation.

The scope of work for this task order will remain the same. TYLin will continue to provide NVRTA with additional resources to support in-house staff with project management activities which includes:

- Developing and assisting with Requests for Proposals (RSPs) for Design Consultants,
- Providing Quality Control for Construction Plans.
- Developing and assisting with RFPs for Construction Management Firms
- Drafting Staff Reports and Approval Documents
- Communication and Collaboration with stakeholders
- Providing additional Project Management tasks.
- Providing AutoCAD drafting services.
- Assist in preparing permit applications.
- Assist in preparing utility service applications.
- Providing assistance in other ad-hoc tasks.

Should you require any additional information, please do not hesitate to contact me or my Deputy Project Manager, Eva Cheung. I can be reached by phone at (510) 457-3044 or by email at [john.kenyon@tylin.com](mailto:john.kenyon@tylin.com). Eva Cheung can be reached at (510) 457-3034 or [eva.cheung@tylin.com](mailto:eva.cheung@tylin.com).

Respectfully,

**TYLin**

John D. Kenyon  
Associate Vice President

CC: Michael Pyrz/TYLin; file





## NAPA VALLEY TRANSPORTATION AUTHORITY **COVER MEMO**

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### **SUBJECT**

Free Transit and Fare Subsidy Programs

### **STAFF RECOMMENDATION**

That the Napa Valley Transportation Authority (NVTA) Board receive a report on the costs to subsidize fixed route fares for K-12, Low Income Adults and Elderly and/or Disabled riders.

### **EXECUTIVE SUMMARY**

At its October 16, 2024 meeting, the Board of Directors requested an agenda item to discuss a Free Fare program. The attached board memo outlines the cost of each subsidy category by jurisdiction. It should be noted that these are just estimates based on boarding and alighting's, fare media sales, and poverty levels in each jurisdiction.

### **FISCAL IMPACT**

None for this item, however, if the Board decides to subsidize K-12, low-income adults, and/or elderly and disabled rider fares, the cost could be up to \$38,937 annually and new revenues would need to be identified to backfill the budget gap.



## NAPA VALLEY TRANSPORTATION AUTHORITY Board Agenda Memo

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**TO:** NVTA Board of Directors  
**FROM:** Kate Miller, Executive Director  
**REPORT BY:** Kate Miller, Executive Director  
(707) 259-8634 / Email: [kmiller@nvta.ca.gov](mailto:kmiller@nvta.ca.gov)  
**SUBJECT:** Free Transit and Fare Subsidy Programs

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### **RECOMMENDATION**

That the Napa Valley Transportation Authority (NVTA) Board receive a report on the costs to subsidize fixed route fares for K-12, Low Income Adults and Elderly and/or Disabled riders.

### **COMMITTEE RECOMMENDATION**

None

### **BACKGROUND**

At its October 18, 2024 meeting the NVTA Board received a comprehensive report about free and subsidized fare programs offered by public transit providers in the North Bay Area. During that meeting, the Board requested additional information about costs to provide free fares for K-12, low income, and elderly and disabled riders.

While specific rider demographic and associated exact costs are not known, NVTA staff extrapolated the data based on a combination of several factors: the location of where riders get on and off the bus, the number of youth and elderly/disabled passes sold, and the jurisdictions' poverty rate applied to the remaining riders after deducting youth and elderly/disabled riders. Table 1 below estimates the riders and revenues currently generated for each group by jurisdiction.

**Table 1: Estimated K-12, Low Income, and Elderly/Disabled Riders and Subsidy Costs**

Fare Category	Jurisdiction	Number of Riders	Annual Subsidy Cost
K-12	American Canyon	7,505	\$ 3,002
Elderly and Disabled	American Canyon	6,092	\$ 3,960
Low Income Adults	American Canyon	2,532	\$ 1,646
<b>Total American Canyon</b>			<b>\$ 8,608</b>
K-12	Napa City	7,797	\$ 3,119
Elderly and Disabled	Napa City	19,987	\$12,992
Low Income Adults	Napa City	10,218	\$ 6,642
<b>Total Napa City</b>			<b>\$22,752</b>
K-12	Napa County	153	\$ 61
Elderly and Disabled	Napa County	904	\$ 588
Low Income Adults	Napa County	401	\$ 261
<b>Total Napa County</b>			<b>\$ 909</b>
K-12	Yountville	N/A	\$ -
Elderly and Disabled	Yountville	1,620	\$1,053
Low Income Adults	Yountville	965	\$ 627
<b>Total Yountville</b>			<b>\$1,680</b>
K-12	St. Helena	1,272	\$ 509
Elderly and Disabled	St. Helena	2,117	\$1,376
Low Income Adults	St. Helena	678	\$ 441
<b>Total St. Helena</b>			<b>\$2,326</b>
K-12	Calistoga	487	\$ 195
Elderly and Disabled	Calistoga	2,913	\$1,893
Low Income Adults	Calistoga	883	\$ 574
<b>Total Calistoga</b>			<b>\$2,662</b>
<b>Grand Total</b>		<b>66,524</b>	<b>\$38,937</b>

**Free Fares and Ridership**

There is no conclusive evidence that rider subsidies and or free fares have substantially increased ridership consistently across all systems in the Bay Area. NVTA's own promotions, some of which lasted an entire week or weekend, did not result in any sustained ridership increases. The Napa Valley College pass program may be a good indicator of how free fares could affect ridership in Napa Valley as fares are baked in student fees and de facto free over the course of a semester.

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NVTA and MTC each recently issued surveys. For riders responding to the MTC survey, fares were significantly less of an issue than service frequency. On the survey that NVTA administered which was distributed to a sampling of Napa Valley residents, cost of fares did not rise to the top of issues or barriers for riding transit. Rider data from around the state have indicated a concern for personal safety while using transit. On many transit systems, free fares have resulted in higher proportion of unhoused, persons with mental illness, and severely drug addicted as transit vehicles provide a free shelter from the weather and a more comfortable place to sleep, which has intensified public safety concerns.

Staff has attached several research articles offering three varying perspectives on the topic of free transit fares for the Board's information.

*As a reminder, NVTA currently provides the following fare subsidies:*

- All fares on fixed route and VineGo services are heavily subsidized. Fares currently make up only 6% or \$816,000 of the Vine \$13.7 million operating budget and 4.6% or \$62,000 of the \$1.3 million Vine-Go operating budget. If riders were required to pay for the full cost, they would be charged \$24.64 per ride on the Vine and \$49.56 per ride on VineGo.
- Standard adult fares are currently the highest fare any person pays for riding Vine Transit. An adult fare is \$2 on local and regional service, \$3.50 for Express Service, \$6 for the Route 29 to BART. Seniors and disabled individuals pay half that amount for riding a Vine local or regional bus and up to twice that amount on VineGo. Youth fares are \$1.25. NVTA also provides day passes: \$7 for adults, \$5 for youth, and \$3.5 for senior/disabled passes; 20-Ride Passes: \$30 for adults, \$21 for youth, and \$15 for senior/disabled passes; and 31-Day Passes: \$55 for adults; \$37 for youth, and \$25.50 for senior/disabled passes. Route 29 to BART 31-day passes are \$125.
- Fares on the shuttle services operating in the Cities of American Canyon, Calistoga, and St. Helena and in the Town of Yountville are subsidized by the local jurisdictions, determined by the individual jurisdiction's desired approach. On American Canyon and St. Helena Shuttles, Adult rides are \$1 and everyone else pays \$0.50. On the Calistoga Shuttle, residents pay a \$1 and some visitors staying at participating hotels ride for free. In Yountville, all rides are free. The jurisdictions all pay the difference between what it is collected in fares and the 10% to 15% mandatory farebox required by the Transportation Development Act (TDA).
- Other Fare Programs Offered by NVTA include:
  - NVTA participates in the Metropolitan Transportation Commission's Clipper START program which funds half of a single ride for low-income adults 18-64 with household incomes of 200% of the federal poverty level

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or less. Participation in this program is low across the region and additional efforts are being made to market the program. In Napa, we provided 1,544 trips on Clipper START between June 2024-September 2024, which equated to less than \$5,000 in reimbursements from MTC. During that same time period, over 5 million Clipper START trips were reported region wide.

- Napa Valley College students receive a pass in exchange for paying \$7.79 a semester for full time students and \$3.89 a semester for part time students as part of the assessed student fees. Students show their ID which allows them to ride all Vine services for free. A reciprocal agreement with the Solano Transportation Authority allows them to ride Soltrans, Fairfield, and Vacaville Transit systems for free and in exchange, students attending Solano Community Colleges may ride Vine Transit for free.
- Free fares for all riders are provided during BottleRock and LaOnda which has been generously subsidized by the Latitude 38 Entertainment the Napa Valley Vintners who typically provide a combined amount of \$10,000.
- NVTA also has on occasion participated in promotional opportunities providing free fares for a day during events such as Transit Month and Clean Air Days during the months of September and October. These promotions are funded through NVTA's marketing budget.

### **STRATEGIC GOALS MET BY THIS PROPOSAL**

Not applicable

### **ATTACHMENT(S)**

Attachment 1: PRI Article – Cities Should Think Twice Before Embracing ‘Fare-Free’ Transit. PRI is a free market think tank.

Attachment 2: Chapter 3 from National Academies Press Book on Fare-Free Transit Evaluation. The National Academies Press publishes reports issued by The National Academies of Science, Engineering, and Medicine.

Attachment 3: Transit Center Article - Should Transit Be Free? – Transit Center is a public transportation advocacy organization based in New York City.

## Cities should think twice before embracing ‘fare-free’ transit

**PRI** [pacificresearch.org/cities-should-think-twice-before-embracing-fare-free-transit](https://pacificresearch.org/cities-should-think-twice-before-embracing-fare-free-transit)

March 14, 2024



On Jan. 1, 2020, the InterCity Transit agency servicing Olympia, Wash., and nearby cities went “zero fare.” From 2020 through 2023, the city of Tucson, Ariz., made its public transit system “free” to ride, with the council declaring “our intention to go fare-free transit.” Activists in Los Angeles have argued that “public transit is a public good for which everyone should split the bill, no matter how often they use it.”

Proponents of abolishing fares correctly note that the typical public transit system is already heavily subsidized as it is and the amount of revenue collected through fares covers only a fraction of the money needed to operate such systems.

Given this, they argue, government should go the extra step, abolish fares entirely and find the money needed to cover the shortfall elsewhere. Often, proponents find zero-fare transit a desirable end in itself, while others will specifically cite the benefit of such a system for lower-income people and/or possible environmental benefits from more people potentially using transit instead of cars.

There are good reasons to be skeptical of ditching fares.

### **Problem 1: Few people use or will use public transit**

Proponents of zero-fare public transit have to contend with a fundamental problem: most people don't use public transit and probably won't rely on it for the foreseeable future. Nationwide, according to the U.S. Census Bureau's American Community Survey, just 3.8% of the nation's commuters used public transit to go to work as their primary mode of transportation in the five year period up to 2022.

After years of stagnation in public-transit ridership throughout the years, the coronavirus pandemic resulted in a sharp drop in ridership across the country. Nationwide, public transit systems have shown slow reuptake in the years since 2020. Today about three times as many Americans work from home than rely on public transit.

**Read the Free Cities Center booklet about transit, "Putting Customers First."**

**Watch this Free Cities Center video about public-transit subsidies.**

While majorities of residents of some distinctively high-density cities like San Francisco report frequent usage of public transit, these are the exceptions rather than the rule. While less than 10% of Los Angeles commuters use public transit to get to work, as few as 1.6% of commuters in Tucson use public transit.

How do most Americans get around? By car, of course. As a strictly practical matter, in most cities, any proposal to make public transit "free" entails shifting finite public resources toward a means of transportation the vast majority most don't need to get around.

While abolishing fares often is followed by an increase in transit ridership, research from the National Academies of Sciences indicates much of the increased ridership comes from people who already regularly use public transportation. And much of the rest comes from people who otherwise would walk or bicycle.

## **Problem 2: Trade-offs of free transit are probably not worth it**

There are reasons to be skeptical of the idea that dropping fares is the answer. For one, not all transit systems are the same. Some localities have a handful of bus lines along main streets covering a relatively small geographic area, while others have a robust mix of bus-lines and light-rail servicing vast regions. What might be plausibly argued for one can't necessarily be argued for another.

As the pro-public transit TransitCenter has argued, "the case for zero-fare transit is strongest at small agencies with low ridership, where going fareless can improve riders' experience with minimal impact on current service capacity. For agencies with significant ridership or agencies looking to put good transit within reach of more people, however, forgoing all fare revenue would substantially impede the ability to provide service, let alone improve or expand it."

Absent a substitute funding source, abolishing fares necessarily means foregoing revenue that could be used toward those very practical and desirable goals.

Los Angeles' Metro system is already propped up by a sales tax and Angelenos still mostly don't use it. Olympia's move to "zero fare" was in part made possible by a local sales tax measure approved in 2018 to specifically help fund the agency. Tucson, meanwhile, has been considering a sales tax hike to make "free" transit possible.

### **Problem 3: Fare-free transit comes with its own problems**

Research published in 2012 by the National Academies of Sciences noted that, "Some public transit systems that have experimented with or implemented a fare-free policy have been overwhelmed by the number of new passengers or been challenged by the presence of disruptive passengers, including loud teenagers and vagrants."

A decade after those observations were reported, Tucson's experience with fare-free transit from 2020-2023 is certainly representative of the latter set of problems. Bus drivers and riders reported a sharp increase in assaults and general perception of lawlessness on city buses.

"We have become a mobile refuge from the elements, frequented by drug users, the mentally ill and violent offenders that have made Sun Tran unsafe to ride," the local Teamsters union warned in a letter to the city. "I literally saw a guy pull down his pants and poop on the bench that our passengers are supposed to be sitting on," a union representative reported at a city transit meeting.

Such instances mirrored what happened in Portland, Ore.'s "Fareless Square." For four decades until 2012, Portland offered fareless transit around part of its downtown. While long popular, persistent issues with crime and fiscal concerns resulted in fares being returned to the zone.

Of course, such problems aren't unique to fare-free transit systems. The Los Angeles Metro system, for example, has long been plagued by rider reports of reduced safety.

But city leaders seriously considering fare-free transit need to think carefully about the potential for safety issues to undermine public interest in using transit, as well as whether dropping fares will make it easier or harder to deal with such problems.

Instead of foregoing revenue from fare collection, local transit agencies should ensure they are making the most of the resources they have. Revenue collected from transit riders is revenue that can go toward improving and expanding service.



*Sal Rodriguez is opinion editor for the Southern California News Group and a senior fellow with the Pacific Research Institute. He is the author of Dynamism or Decay? Getting City Hall Out of the Way, published by the Pacific Research Institute.*

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Visit [NAP.edu/10766](https://www.nap.edu/10766) to get more information about this book, to buy it in print, or to download it as a free PDF.

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## CHAPTER 3

# Fare-Free Transit Evaluation in Practice

This chapter reviews the state of the practice of fare-free transit evaluation. This review was informed by a transit agency survey and interviews with staff from transit agencies, community organizations, and transit advocacy groups. The findings from this research informed the development of the fare-free transit evaluation framework.

## **What Research Has Been Conducted on Fare-Free Transit Evaluation?**

Despite growing interest in fare-free transit among U.S. transit agencies, there are few studies on fare-free transit in the United States; most research appears to explore case studies in other countries (Kębłowski 2020). Before the publication of this report, there were no apparent examples of a robust fare-free transit evaluation framework.

Most research on fare-free transit in the United States has focused on small urban areas, rural communities, or university and resort towns where transit agencies provide full fare-free transit. Much of this research was synthesized in *TCRP Synthesis 101: Implementation and Outcomes of Fare-Free Transit Systems* (Volinski 2012).

Major findings from that report include the following:

- Most fare-free transit agencies serve small communities.
- Transit agencies with low farebox recovery ratios are most likely to implement fare-free transit.
- Some funding sources reward transit agencies for operating fare-free.
- Fare-free transit can be a competitive asset for resort communities.
- Fare-free transit can improve operations on high-volume services.
- Implementing fare-free transit typically increases ridership by 20% to 60%.
- Fare-free transit eliminates fare disputes with operators but can increase the presence of disruptive passengers.
- There can be new or increased costs associated with fare-free transit.
- About 5% to 30% of new fare-free transit trips are made by people switching from other motorized modes.
- Fare-free transit can be a point of community pride.

## **What Is the Basis of the Evaluation Framework Developed in This Research?**

The fare-free transit evaluation framework presented in Chapter 2 of this report was developed based on qualitative and quantitative state-of-the-practice research described in the following. This research consisted of three primary methods:

- A **survey** of transit agencies at various stages of fare-free transit consideration or implementation.
- **Interviews** with staff from transit agencies, community organizations, and transit advocacy groups.
- A **literature review** of academic research, planning work, and journalism on fare-free transit.

More detail on each of these methods is provided in the following.

## Survey of Transit Agencies

The research team surveyed 35 U.S. transit agencies and one state transportation agency to gather various perspectives on fare-free transit evaluation. The survey respondents represented transit agencies from various categories of fare-free transit ([Exhibit 3-1](#)).

The respondent agencies varied in terms of operating size and context. All full fare-free respondent transit agencies served small urban, rural, resort, or university-dominated communities, with smaller ridership, lower farebox recovery, and lower operating expenses than systems in larger metro areas. The partially and not fare-free respondents represented a wide range of transit agency sizes in terms of passenger trips provided, operating expenses, and farebox recovery. Additional information on the methods and findings from the survey is provided in [Appendix A](#).

## Interviews

The research team conducted interviews with two types of subjects:

- **Transit Agency Staff:** The project team identified 23 transit agencies with which to conduct staff interviews and assess as case studies based on the transit agency responses and other research into fare-free transit. These 23 agencies vary in terms of size and type of community served. Staff from the case study transit agencies were interviewed through video conference calls or by email. The role the interviewed staff played in the evaluation or implementation of fare-free transit var-

ied across transit agencies. Interview findings were used to create the case studies in Chapter 4 of this report and inform the findings on the state of the practice and the evaluation framework.

- Staff from Community Organizations and Transit Advocacy Groups:**  
 The project team conducted interviews with staff from community-based organizations and transit advocacy groups to gather information on perspectives of fare-free transit from various transit stakeholders. The project team leveraged existing connections with community representatives in Chicago and elsewhere in the United States to solicit feedback from eight organizations. Additional information about the interviews and key findings can be seen in Appendix C.

Survey Agency Category	Description of Category	No. of Agencies Surveyed
<b>Full fare-free</b>	Transit agency does not collect fares from any riders.	14
<b>Partially fare-free</b>	Transit agency does not collect fares from specific groups of riders on certain routes or transit services or in defined areas. These transit agencies may have been considering piloting or implementing fare-free transit.	16
<b>Not fare-free</b>	Transit agency collects fares from all riders. These transit agencies may have been considering piloting or implementing fare-free transit. This category also includes one state transportation agency respondent.	6
<b>Total</b>		<b>36</b>

**Exhibit 3-1. Transit agencies surveyed.**

## Literature Review

Throughout the development process for the survey, interviews, and evaluation framework, the project team reviewed various academic and professional research documents, journalistic assessments of fare-free transit evaluations and implementations, and transit agency or consultant reports and briefs. These documents are cited throughout this report.

# What Is the State of the Practice?

Findings from the research team's survey, interview, and literature review work are summarized in the following under two main topics:

- **Fare-free transit impacts:** The measured and anticipated effects of fare-free transit for transit agencies and the communities they serve.
- **Fare-free transit evaluations:** How transit agencies have evaluated the impacts and long-term success of fare-free transit in their communities.

## Fare-Free Transit Impacts

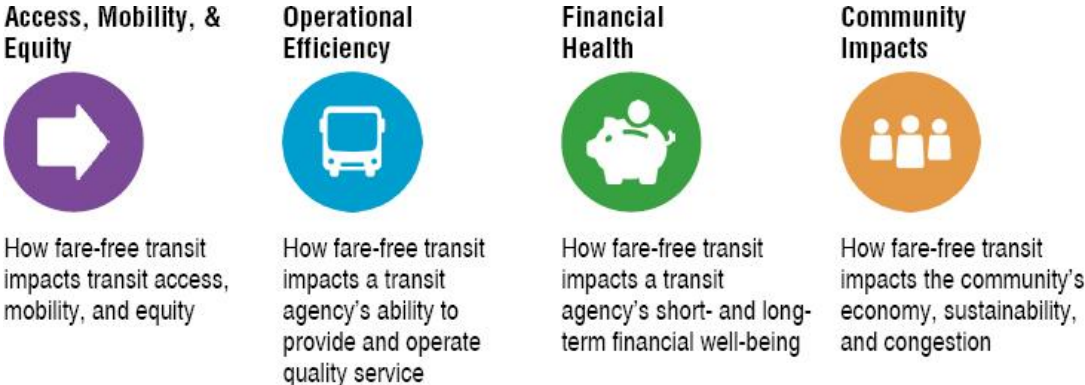
Fare-free transit has many impacts—both costs and benefits. These costs and benefits are borne by different stakeholders; riders, non-riders, transit agency staff, local government, non-profit organizations, and the broader community are all affected.

The impacts of fare-free transit were commonly cited by survey respondents and interviewees as the primary way transit agencies organized their evaluation and/or monitoring of fare-free transit. These impacts can be organized into two categories:





- **Measurable impacts.** These impacts can be measured and shown to have been an outcome of fare-free transit. Examples of measurable impacts include changes in ridership, operating costs, or farebox revenue. Although some transit agencies have measured these impacts, many other transit agencies have not. This makes generalizing and predicting measurable impacts of fare-free transit difficult in many cases.
- **Assumed impacts.** Assumed impacts include costs and benefits that *cannot* easily be measured, but reason and logic and sometimes qualitative information lead transit agencies to assume they are occurring. Examples of assumed impacts include changes in the perceived or actual safety and comfort of passengers, community traffic congestion, and greenhouse gas emissions.

This section summarizes the research team's findings on the measured and assumed benefits and costs of fare-free transit. Further, the impacts are organized under four common themes: access, mobility, and equity;

operational efficiency, financial health, and community impacts (see Exhibit 3-2). Exhibit 3-3 outlines the impacts discussed in this section.



**Exhibit 3-2. Fare-free transit impact themes.**

Themes	Impacts
 <b>Access, Mobility, &amp; Equity</b>	<p><b>Benefits</b></p> <ul style="list-style-type: none"> <li>▪ Increases transit ridership</li> <li>▪ Reduces financial barriers to accessing transit</li> <li>▪ Mitigates impacts of historically inequitable transportation policy</li> <li>▪ Increases focus on operating service over collecting revenue</li> <li>▪ Eliminates fare-related policing</li> <li>▪ Expands access to those who do not benefit from discounted programs provided through employers</li> </ul> <p><b>Costs</b></p> <ul style="list-style-type: none"> <li>▪ May constrain funding that could be spent on service</li> <li>▪ May lead to a more regressive source of funding (e.g., sales tax)</li> </ul>
 <b>Operational Efficiency</b>	<p><b>Benefits</b></p> <ul style="list-style-type: none"> <li>▪ Increases service productivity</li> <li>▪ May decrease dwell times, increasing speed and reliability</li> <li>▪ Eliminates fare-related disputes</li> <li>▪ Eliminates fare collection equipment and attendant labor requirements (e.g., operations and maintenance)</li> </ul> <p><b>Costs</b></p> <ul style="list-style-type: none"> <li>▪ May lead to overcapacity on some trips and require additional service</li> <li>▪ May increase paratransit demand and require additional service</li> <li>▪ May restrict a transit agency's ability to collect ridership data</li> <li>▪ May increase the presence of disruptive passengers and result in additional security costs and impacts</li> </ul>
 <b>Financial Health</b>	<p><b>Benefits</b></p> <ul style="list-style-type: none"> <li>▪ Reduces or eliminates fare collection costs</li> <li>▪ May reduce overall cost per passenger trip</li> <li>▪ May expand transit agency eligibility for new funding sources</li> </ul> <p><b>Costs</b></p> <ul style="list-style-type: none"> <li>▪ Eliminates farebox revenue, which may be considerable for many transit agencies</li> <li>▪ Likely to require new revenue sources, such as taxes, municipal contributions, or private partnerships</li> </ul>
 <b>Community Impacts</b>	<p><b>Benefits</b></p> <ul style="list-style-type: none"> <li>▪ May reduce traffic congestion</li> <li>▪ May reduce local pollution and greenhouse gas emissions</li> <li>▪ May catalyze development and/or increase land value</li> <li>▪ May increase community pride</li> <li>▪ Allows riders to spend money in the community that they would have spent on transit</li> </ul> <p><b>Costs</b></p> <ul style="list-style-type: none"> <li>▪ May increase public criticism of transit agency and its fare policy</li> </ul>

Note: Impacts noted in this chart may vary by type of fare-free transit. For example, a partially fare-free transit system may not completely eliminate farebox equipment, which would not allow the transit agency to benefit from reduced operating and maintenance costs associated with fare collection equipment.

**Exhibit 3-3. Summary of fare-free transit impacts.**



## Benefits

The primary benefits from fare-free transit reported by survey respondents and interviewees include greater mobility for community members, social equity improvements, more efficient transit service, reduced fare collection costs, and local economic growth. These key benefits and others are discussed in more detail in the following.

### *Access, Mobility, and Equity*

Survey respondents and interviewees reported that fare-free transit almost always causes an immediate increase in transit ridership. To the extent that a financial barrier to accessing transit is removed for community members, their mobility is also improved. In many instances, this improved mobility means greater access to opportunity (e.g., school, shopping, recreation, healthcare) for community members. Survey respondents and interviewees also reported that fare-free transit is assumed to improve social equity outcomes, as passengers with low incomes save money they might otherwise have spent on transit.

More specific survey and interview findings related to access, mobility, and equity benefits of fare-free transit include the following:

- Transit agencies that went fare-free before the COVID-19 pandemic saw an increase in fixed-route ridership from 20% to over 100% in the first 2 years, especially among those who are young, those with low incomes, and those experiencing homelessness. Most transit agencies that went partially fare-free for only select populations did not see significant increases in ridership.
- Transit agencies experienced a range of paratransit ridership changes after going fare-free, from no change to a 60% increase.
- Transit agencies that piloted or implemented long-term fare-free transit following the COVID-19 pandemic have also seen increased ridership, up to 26% ([Northern Virginia Transportation Commission 2021](#)).
- Although some transit agencies already provide discounts to some rider groups, there are often barriers to accessing these discounts, such as

personal identification or application requirements and other administrative burdens. The impact of these barriers is clear from observing the low uptake rates of many programs for people with low incomes. Full fare-free transit eliminates these barriers and reduces administrative burdens for both riders and transit agencies (Saphores et al. 2020).

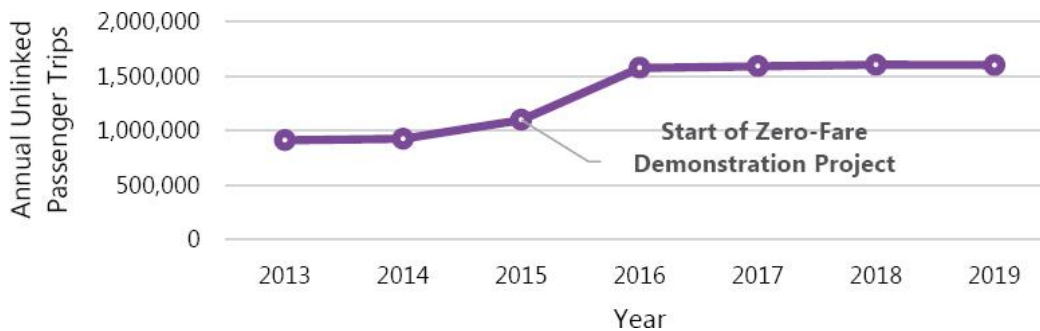
- Partial fare-free transit that is focused in areas and on modes that are most used by minority and youth riders and riders with low incomes allows transit agencies to maintain a source of fare revenue, particularly from riders with higher earnings.
- Existing transit subsidies, such as employer passes, often provide de facto fare-free transit to certain riders, many of whom have higher incomes. This is an inequitable outcome where riders who can afford transit receive discounts, and riders who may benefit more from fare-free transit do not have access to these discounts (Saphores et al. 2020). Fare-free transit can reduce this inequity.
- Fare-free transit can reduce transit agencies' focus on farebox recovery and increase their attention to service provision based on need, creating a more equitable service that does not consider ability to pay (Cohen 2018).
- Many riders prefer full fare-free transit to partial fare-free transit because the latter may involve fare enforcement, which can lead to over-policing of racial and ethnic minorities, who are often more likely to be transit-dependent (Perotta 2017, Carter and Johnson 2021).

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## **Ridership Increase at Mountain Line**

In 2015, Mountain Line (Missoula, MT) piloted its “zero-fare demonstration project.” Within 3 years, the transit agency saw a 70% increase in ridership. The increase was largest in the first 2 years after the fare-free pilot began and then stabilized.

### **Mountain Line Ridership, 2013–2019**



Source: National Transit Database, Annual Unlinked Passenger Trips

## Operational Efficiency

Fare-free transit may produce operational benefits, such as increased productivity and reduced dwell times. More specific survey and interview findings related to operations benefits of fare-free transit include the following:

- Because fare-free transit almost always increases ridership, it also typically leads to increased productivity, in terms of boardings per revenue hour. This and other efficiency measures can make transit agencies eligible for additional funding, such as STIC funding (FTA n.d.).
- Eliminating fare collection can improve service quality by reducing dwell times through efficient, all-door boarding, without the need for additional technology such as rear-door card readers (Saphores et al. 2020, Volinski 2012, Northern Virginia Transportation Commission 2021). This increases reliability and can offset the increase in boarding time caused by increased ridership.
- Because full fare-free transit eliminates fare collection, it also eliminates the possibility of fare-related conflicts between operators and passengers.
- Full fare-free transit eliminates farebox and other fare collection equipment, which reduces the number of things an operator must operate, maintain, and monitor. This also reduces maintenance employees' workload and eliminates the step of emptying the farebox when the bus pulls into the base.

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## LINK Transit’s STIC Funding Implications

Link Transit (Wenatchee, WA) found in its fare-free transit evaluation that the anticipated ridership increase was expected to qualify the transit agency for approximately \$275,000 in additional funding from the STIC funding program. STIC is a federal program designed to reward high-performing small transit systems. The program provides

funding to transit agencies in small urbanized areas with a population under 200,000 through the evaluation of six performance metrics with established thresholds. Transit agencies qualify for \$274,458 per metric threshold met or exceeded. Link Transit exceeded five out of six thresholds in 2019 (see “Link Transit STIC Funding Metrics and Thresholds, 2019”).

### Link Transit STIC Funding Metrics and Thresholds, 2019

Metric	Funding Threshold	Link Transit Values
Passenger Miles per Vehicle Revenue Mile	5.87	<b><u>5.44</u></b>
Passenger Miles per Vehicle Revenue Hour	100.70	<b>105.42</b>
Vehicle Revenue Miles per Capita	11.68	<b>29.74</b>
Vehicle Revenue Hours per Capita	0.74	<b>1.53</b>
Passenger Miles per Capita	78.55	<b>161.76</b>

Metric	Funding Threshold	Link Transit Values
Passenger Trips per Capita	11.98	<b>14.77</b>

Source: Nelson\Nygaard Consulting Associates, Inc. 2021, Figure 5-5

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## *Financial Health*

Fare-free transit can have financial benefits for transit agencies, such as reductions in fare collection costs, lower operating costs per passenger, and access to more stable funding. More specific survey and interview findings related to the financial benefits of fare-free transit include the following:

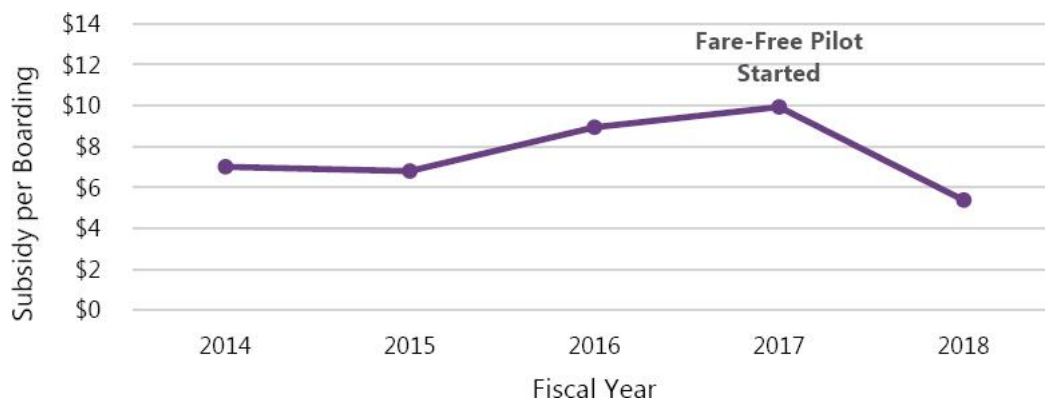
- Under full fare-free transit, transit agencies save on existing and future costs of collecting fares including producing and selling fare media; operating and maintaining fareboxes; counting, securing, and transporting cash; and upgrading fare technology.
- Fare-free transit often results in lower operating costs and increased ridership, which reduces a transit agency's costs per passenger trip.
- Fare-free transit expands funding opportunities that could become more reliable than fare revenue, including grants specific to fare-free transit, grants for increasing operating efficiency, and community funding partnerships (Volinski 2012, Northern Virginia Transportation Commission 2021).
- By eliminating fare collection costs and the administrative costs associated with discounted fares, small to mid-sized transit agencies have been able to lower operating costs and qualify for additional state and federal grant funding for operating expenses (Volinski 2012).
- Transit agencies have used a wide variety of replacements for farebox revenue, including a corporate gross receipts tax, sales tax, municipal general funds, advertising, private partnerships, a dedicated transit tax or fee, or a combination of methods.

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## **Financial Efficiency at ART**

Area Regional Transit (ART) (St. Lucie County, FL) saw an increase in financial efficiency following the elimination of fares. Despite the foregone fare revenue, the ridership increase resulted in a lower subsidy per boarding (the operating cost not covered by fares or advertising revenue) (see “ART Subsidy per Boarding, 2014–2018”).

### ART Subsidy per Boarding, 2014–2018



Source: Florida Department of Transportation—District 4 2020

## Community Impacts

Fare-free transit doesn't just benefit transit agencies and their riders. External benefits can range from short-term congestion reduction to long-term economic development and civic pride. Many of these benefits align with community goals and priorities at all levels (e.g., stakeholder, transit agency, municipal, state, federal) around equity, mobility, and sustainability. More specific survey and interview findings related to external community benefits of fare-free transit include the following:

- Community members who do not ride transit can also benefit from the ridership increases caused by fare-free transit, as mode shift to transit may reduce carbon emissions and traffic congestion (Baxandall 2021, Kębłowski 2020). Some fare-free transit supporters describe mode shift

to reduce carbon emissions as a key reason for supporting fare-free transit. Fare-free transit is also considered by some to increase the quality of life and public health of residents by reducing their exposure to local pollution, also through mode shift and reduction of single-occupancy vehicle use (Kębłowski 2020, Northern Virginia Transportation Commission 2021, Baxandall 2021).

- Fare-free transit almost always improves mobility and access to destinations, which can increase land value for certain uses. This improved access can attract real estate development, which could grow a community's property tax revenue, as well as provide public realm and infrastructure improvements (Kębłowski 2020, Cohen 2018).
- Many transit agencies with fare-free transit report that their fare-free transit is a point of community pride—even to those who do not use transit.
- Although fare-free transit reduces or eliminates fare revenue to a transit agency, the money passengers save is likely circulated elsewhere in the community, potentially increasing its impact (Mid-America Regional Council n.d.).

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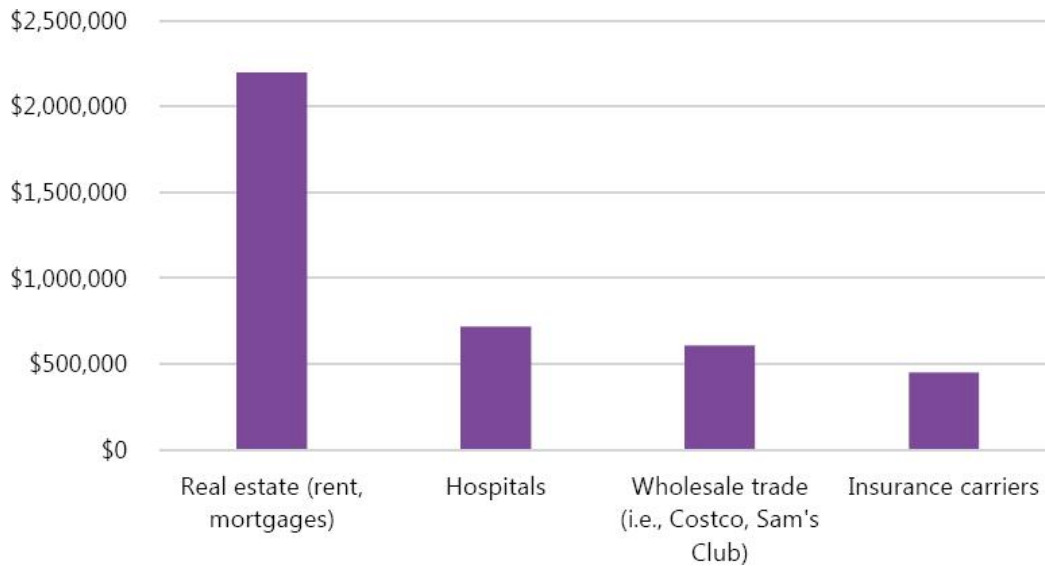
## **Local Economic Impact in Kansas City**

In 2020, KCATA (Kansas City, MO) worked with the Center for Economic Information at the University of Missouri Kansas City to measure the economic impacts of a proposed fare-free transit policy, ZeroFare KC. The resulting research showed that fare-free transit would have a positive impact on the quality of life in the Kansas City Region. Based on the researchers' economic model, the regional gross domestic product was projected

to increase between \$13 million and \$17.9 million because of ZeroFare KC. This positive impact would be the result of the fare cost savings to riders, many of whom have annual incomes below \$40,000. These riders would be able to redirect fare cost savings toward real estate,

hospitals, wholesale trade, and insurance (see “Estimated Spending in Top Four Categories”).

### Estimated Spending in Top Four Categories



Source: RideKC 2020

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## Costs

Despite the potential benefits of fare-free transit options, many transit agencies, riders, advocates, and other stakeholders see serious challenges and costs associated with fare-free transit, including fare revenue loss, a potential increase in service requirements, safety and security issues, and other trade-offs. These costs and drawbacks to fare-free transit are discussed in greater detail in the following.

### *Access, Equity, and Mobility*

Negative or concerning aspects of the impacts of fare-free transit on access, equity, and mobility are most often tied to the potential for funding trade-offs. Specific survey and interview findings related to access, mobility, and equity costs of fare-free transit include the following:



- Some transit stakeholders think transit agencies should keep their primary focus on providing higher-quality service, especially to people with low incomes or people living in underserved communities. To these stakeholders, the focus on fare-free transit is misplaced; some argue that making a service free is not as important as making a low-quality service better, even if it costs a fare.
- Transit agencies should ensure that any fare revenue replacement funding sources are not regressive. The equity benefits of fare-free transit could potentially be lost if replacement revenue comes from a regressive source like a sales tax. Some advocates suggest a graduated income tax that ensures those who earn more pay more.
- Eliminating fare revenue may cause service cuts for some transit agencies, which may negatively impact transit riders' mobility. In areas where the majority of transit riders are those with low incomes or people of color, this may have negative equity impacts. Fare-free transit should not be used as an excuse for not improving service or ensuring access to transit (e.g., meeting Americans with Disabilities Act [ADA] requirements).
- Those who benefit from fare-free transit the most do not always have the time and energy to advocate for themselves, so it can be difficult to measure their priorities. Transit agencies should partner with community groups to disseminate information to their audiences with a particular focus on those with low incomes, people of color, older adults, persons with disabilities, and youth riders. Through this partnership, community groups should be compensated for their time. Additionally, it is important for transit agencies to acknowledge and respond to any feedback received.

## *Operational Efficiency*

Increased ridership from fare-free transit can challenge transit operations. Specific survey and interview findings related to operational costs of fare-free transit include the following:

- The increase in ridership from fare-free transit can cause overcapacity issues on some trips. Some transit agencies have had a hard time supporting increased demand after a fare-free transit implementation. To support increased demand, some transit agencies need to purchase new vehicles, hire new staff, and operate additional service—all of which is costly.
- Because full fare-free transit requires complementary ADA paratransit to also be fare-free<sup>3</sup>, transit agencies are concerned that the lack of fares will increase demand for paratransit trips to a level that cannot be supported by the transit agency, due to operational (i.e., driver and vehicle availability) and financial constraints. To counter this, some transit agencies tighten paratransit eligibility requirements to reduce demand while remaining in compliance with the law.
- Because hiring can be challenging for many transit agencies, many transit agencies are concerned about the prospect of needing to increase staffing to support fare-free transit (Dolven 2022, Rosenberg 2022).
- Eliminating fare collection may restrict a transit agency's ability to collect ridership data without fareboxes and fare media (e.g., origin-destination data). This may lead to increased costs for on-board surveys and other data collection methods.
- Many transit stakeholders are concerned about the potential for or actual increase in disruptive riders on fare-free transit. These concerns, which typically are about people with mental health or substance abuse issues, are a major barrier to fare-free transit.<sup>4</sup>
- Most surveyed transit agencies that had implemented fare-free transit did not find disruptive passengers to be a major challenge after implementation, due to their overall small numbers. Some transit agencies have had success mitigating disruptive behavior with strong code-of-conduct policies, destination requirements, and policies that require disembarking at the final stop.
- Transit agencies that measured the impacts on safety and security incidents after fare-free implementation either saw a slight increase or decrease in incidents per boarding. Many transit agencies experienced reductions in passenger conflicts due to the elimination of fare-related conflicts between passengers and operators (Hodge et al. 1994, Sharon Greene + Associates et al. 2008).

- If transit agencies respond to disruptive passengers on full fare-free transit with increased policing, then this may result in overpolicing of riders who are people of color and riders with low incomes.

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<sup>3</sup> Federal Regulation 37.135(c) requires that the paratransit fare for an ADA eligible rider not exceed twice the fixed-route full fare of a similar trip. FTA Circular 4710.1 (FTA 2015) clarifies that the maximum that may be charged for paratransit when the equivalent fixed-route fare is zero would therefore be zero as well.

<sup>4</sup>TCRP Synthesis 121: *Transit Agency Practices in Interacting with People Who Are Homeless* (Boyle 2016) noted that transit agencies do not have enough resources to meaningfully help people who are experiencing homelessness who are riding the system. Partnerships with social services, ongoing outreach, and recognizing the humanity of individuals were identified in this report as ways to create a safe atmosphere on transit.

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## **The Rapid's Challenges with Disruptive Passengers**

One example of a transit agency for which disruptive passengers were a significant challenge is The Rapid (Grand Rapids, MI). The transit agency provided fare-free transit on two routes, but reinstated fares on one line due to individuals experiencing homelessness utilizing the services for sheltering purposes and behavioral issues related to public intoxication. The Rapid did not have any type of code-of-conduct policy related to these issues in place and reported a desire for best practices from other agencies in dealing with disruptive passengers.

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## *Financial Health*

Long-term financial health is almost always the first concern facing transit agencies when they are considering fare-free programs. The impact of fare-free transit on costs and revenues varied widely across the transit agencies surveyed and interviewed, depending on existing ridership, transit agency size, alternate funding sources, and previous fare systems.

Specific survey and interview findings related to the financial costs of fare-free transit include the following:

- Full fare-free transit has proven more viable for small- to mid-sized transit agencies than for large transit agencies, as revenue from systems with a lower farebox recovery rate is more easily replaced.
- For larger transit agencies, where fare revenue is a larger portion of operating revenues, considerable replacement revenue would be required for the transit agency to go full fare-free without cutting service. Finding replacement revenue is often cited as the largest challenge to providing partial or full fare-free transit on systems with a high farebox recovery ratio.

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## **Corvallis Transit System's Replacement Revenue**

The idea of implementing fare-free transit on the Corvallis Transit System in Oregon was promoted by the Corvallis Sustainability Coalition as a strategy to make the city more livable. To replace fare revenue, the city of Corvallis implemented a Transit Operations Fee (TOF) on residents and businesses through their monthly utility services bill. During city council meetings, city and transit agency staff framed transit as a necessary public utility to which every member of the community should contribute. The transit agency credits this framing with the success of the program and reports high levels of community pride in fare-free transit service.

The TOF is reviewed annually by the city council, so the council has the option to adjust the fee every year. Revenue at the “floor” level is approximately \$900,000 annually, with 76% of the fee replacing the general fund and 21% replacing fares. The remaining 3% is intended for increases in service. The TOF also provides a source for local matching fund requirements for the purchase of new equipment. In addition to TOF contributions levied on a per-bed basis, Oregon State University continues to support transit with a long-standing annual direct contribution of \$130,000. In 2022, the fee was \$3.44 per month for single-family homes, \$2.38 per unit in multifamily homes, and \$0.054 per trip for non-residential customers. This con-

sistent revenue source ensures long-term financial viability for the transit agency.

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## *Community Impacts*

There are considerably fewer negative community impacts from fare-free transit than there are benefits. One negative community impact that has occurred on some systems is an increase in public criticism of a transit agency, especially in the narrative that the transit agency is providing “handouts” to riders that don’t pay their fair share for the service they are using. Although some transit agencies have seen an increase in public criticism, they also typically see an increase in public compliments following fare-free implementation. The prevalence of different responses may vary based on the transit agency’s messaging.

The increase in public discourse in response to a change in policy is not unique to public transit; major transportation policy changes across all modes often result in an increase in positive and negative public discourse surrounding the policy change.

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## **Challenges with Public Perspective in Ellensburg**

Some fare-free transit agencies, such as Ellensburg Central Transit (Ellensburg, WA), experienced a small but loud opposition early in the program, which eventually faded out as people experienced the new system. Mountain Line (Missoula, MT) reported increases in community pride and ownership of the fare-free programs and that not charging fares is now an integral part of the system identity.

More public pushback occurred in systems that reported more problems with disruptive passengers. For example, Sandy Area Metro (Sandy, OR) instituted a \$1 fare on its previously fare-free transit after complaints from local businesses about destination-less riders. However, ridership fell dramatically and began to negatively

impact downtown businesses. The city then returned to mostly fare-free transit while keeping a small charge for out-of-town routes to mitigate some of the issues stemming from fare-free service.

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## International Fare-Free Transit Context

Fare-free transit has been used as a tool to achieve sustainability goals, reduce congestion, and reduce the cost of transportation across Europe, South America, and Asia. To better understand the international context of fare-free transit, the research team reviewed a 2020 report, *Why (Not) Abolish Fares? Exploring the Global Geography of Fare-Free Public Transport*, which documented different perspectives on fare-free transit across the world (Kębłowski, 2020).

The report found that more than 100 cities worldwide had made public transit free, mostly in Europe, with implementations ranging from small communities of around 10,000 residents to counties of over 100,000 residents. Key outcomes from the case studies include the following:

- Full fare-free transit programs show that removing fares tends to substantially increase transit ridership.
- Full fare-free transit does not typically reduce car use unless combined with measures to increase the cost of driving, such as congestion pricing, parking pricing, or travel restrictions on personal automobiles.
- Additional benefits include additional access to jobs, increased public satisfaction with transit, opportunities for new funding, cost savings, and traffic safety.

Details on the outcomes from Estonia, France, Poland, and China are provided in the following:

- **Estonia.** In 2013, Tallinn became the first capital city in the European Union to provide free public transit after the city's annual public transport satisfaction survey, which had previously

shown that fare pricing was riders' most common source of disapproval of the system. Just a year after the introduction of full fare-free transit, ridership increased by 14% while nationwide public transit mode share decreased in Estonia during the same period. Full fare-free transit particularly improved the mobility of residents with low incomes. In the years since fare-free transit was implemented, survey respondents have reported improved access to employment opportunities and a significant increase in overall satisfaction with local public transportation (Cats et al. 2017). Because of the success of Tallinn's free public transport program, Estonia began a push toward nationwide fare-free public transport in 2018 (Gray 2018).

- **France.** Examples of fare-free transit from France show that eliminating fares can increase customer satisfaction and open doors for new funding sources. In Aubagne, France, implementing full fare-free transit eliminated €1.6 million of fare revenue, which spurred the region to levy a transport tax on large businesses that generates approximately €5.7 million for equipment, maintenance, and labor costs. The subsequent system improvements produced a 136% increase in ridership. Similarly, a weekend-only, fare-free bus program in Dunkirk, France, was extended to weekdays to accompany a network redesign and fleet expansion.
- **Poland.** Poland features 21 localities with fare-free transit, the highest nationwide concentration in the world. Each of these transit systems abolished fares after 2010, representing a shift in Polish transportation policy. Poland is using fare-free public transit as a strategy to reduce private vehicle ownership and the pollution and noise associated with car usage. In Lubin County, fare-free transit was implemented as part of a municipal social policy to expand access to transportation services. Initial results have been dramatic, as ridership doubled after a year of fare elimination. In addition to ridership gains, Lubin has seen substantial savings due to eliminating fare enforcement (Dellheim and Prince 2018).
- **China.** While only three municipalities in China offer full fare-free transit, early signs point to the policy's potential. Gaoping is a small but densely populated city of 72,000 residents in Northern China. The government established free transit in 2013 to relieve congestion, encourage transit use, and discourage illegal motorcycle taxis. A 2015 study found

that fare abolition increased transit ridership by 320%. Traffic safety greatly improved due to the subsequent mode shift, providing evidence that fare-free transit could be an effective solution for curbing traffic congestion in countries with high residential density (Shen and Zheng 2015). Changning and Kangbashi offer full fare-free transit as well. Changning's 300,000 residents make it one of the biggest cities without a transit fare; it serves as an international example for other mid-sized cities with similar transportation policy ambitions. The city of Kangbashi, built in anticipation of high population growth, eliminated the transit fare in 2015 to attract future residents (Kębłowski, 2020).

## Fare-Free Transit Evaluations

There are two primary time periods in which fare-free transit can be evaluated: before and after implementation. These evaluation types can generally be described as

- **Feasibility Evaluation:** Conducted before fare-free transit is implemented, to see if it is feasible for the transit agency. This type of evaluation typically focuses on estimating the likely benefits and costs of one or more types of fare-free transit.
- **Post-Implementation Evaluation:** Conducted after fare-free transit has been implemented. This evaluation type usually analyzes how successful fare-free transit has been for the transit agency, including measured benefits and costs. Using this information, transit agencies may recommend continuing or stopping the fare-free transit implementation.

Common elements included in both feasibility and post-implementation evaluations as well as detailed descriptions of how feasibility and post-implementation evaluations have been conducted by U.S. transit agencies are provided in the following.

## Common Evaluation Elements



Although several research documents synthesize evaluations of partial and full fare-free programs in the United States, there are no standard evaluation methods for feasibility or post-implementation evaluations. This research team's review of completed evaluations, however, did uncover several common elements of fare-free transit evaluations.

Most fare-free transit evaluations are focused on answering key questions regarding fare-free transit. In *TCRP Synthesis 101*, the primary questions transit agencies ask were identified through a survey (Volinski 2012):

- Is/was it cost-effective to eliminate the fare collection process?
- What effect did/will fare-free transit have on ridership and system capacity?
- What effect did/will fare-free transit have on service quality and customer satisfaction?

To attempt to answer these questions, transit agencies used a variety of metrics (many of which are measured as estimates), including the following:

- Cost of implementing the fare-free policy (e.g., lost revenue, new service, new vehicles, new facilities) on a per capita basis with the service area
- Change in farebox recovery ratio
- Change in subsidy per rider
- Change in overall service provided (e.g., service hours)
- Savings from eliminating fare collection
- Ridership Impact
- Revenue sources and amounts
- On-time performance
- Fare-free transit's impact on parking (e.g., utilization, cost, provision)

Some transit agencies also used qualitative metrics to evaluate fare-free transit's costs and benefits, such as

- Community feedback: compliments, complaints, and general sentiment
- Bus operator feedback: benefits, challenges, and general sentiment
- Issues with "problem passengers"

# Feasibility Evaluation

In general, only a few transit agencies have systematically evaluated the feasibility of implementing fare-free transit before implementation. Those that did complete formal evaluations of some kind usually conducted literature, peer, and best practices reviews; operational analyses; and financial evaluations.

Some of the key financial issues that have been identified in feasibility evaluations are the following:

- Many transit agencies struggle to find replacements for lost farebox revenue. Without this replacement revenue, some transit agencies decided against going fare-free, especially agencies with higher farebox recovery rates and larger operating budgets.
- When transit agencies did identify alternative funding sources to make up for lost farebox revenue, they typically looked to taxes, municipal general funds, advertising, private partnerships, state and federal grants, or some combination of these and other methods.
- Many transit agencies did not have a long-term alternative funding source secured when beginning fare-free transit.

In *Zero-Fare and Reduced-Fare Options for Northern Virginia Transit Providers*, the Northern Virginia Transportation Commission examined regional, national, and international examples of both full and partial fare-free and reduced-fare programs (2021). As part of this assessment, the report identified several key guiding questions to be considered in feasibility evaluations:

- Who is riding transit currently and who would benefit most from the fare options?
- Is cost the determining factor for mode choice?
- What level of ridership growth can be sustained without substantial added investments?
- What are the costs of fare collection and their relationship to loss in revenue from fare-free implementation?

- What funding options might become available under a fare-free system?

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## **Service Trade-Offs at Iowa City Transit**

Some transit agencies have recently evaluated a fare-free transit option and decided to maintain fares due to concerns about gaps in funding and the need to increase service to keep up with the additional demand. Iowa City Transit (Iowa City Area, IA) conducted a fare-free analysis at the beginning of 2020 as part of the Iowa City Area Transit Study (City of Iowa City 2020). The transit agency opted not to go fare-free because staff felt the expansion of service to Saturdays for most routes and increased service frequency would not have been financially possible without farebox revenue.

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In many cases, transit agencies have found that fare-free transit feasibility evaluations provide only high-level estimates of likely outcomes. With the uncertainty associated with these estimates in mind, several transit agencies found it prudent to advance a pilot fare-free transit program, giving the transit agency time to perform a blended feasibility and post-implementation evaluation that produces more information for decision makers. The structure of pilot programs may vary.

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## **Intercity Transit’s 5-Year Zero-Fare Pilot**

After the passage of a citywide proposition (Proposition 1) in Olympia, WA, Intercity Transit committed to fulfilling its nine community-defined priorities, one of which involves making fare collection more efficient and in line with other peer agencies. After evaluating the impacts, the transit agency found that it was spending more to collect fares than it was receiving in fare revenue. In the end, the transit agency decided a fare-free pilot would serve as the most “economical, effective and fastest way” to achieve the proposition’s goals.

In January 2020, the transit agency implemented a 5-year pilot of fare-free transit. The length of the pilot was chosen to provide

enough time to measure the full range of impacts of the policy, while not committing to a permanent change. In the first month of the pilot, the transit agency's ridership grew by 20% compared to the previous year. Due to the COVID-19 pandemic, the impacts of the pilot will be difficult to measure in the first few years, but the transit agency will continue to monitor progress.

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## **Post-Implementation Evaluation**

Only a few fare-free transit agencies completed an evaluation after the implementation. Of the transit agencies that performed post-implementation evaluations, the metrics used were largely operational and included

- Ridership
- Revenue
- Passenger or vehicle boarding times
- Additional service needs
- Change in passenger destinations
- Public opinion

When assessing public opinion and other, more qualitative metrics, transit agencies have used several tools, including informal operator feedback, on-board surveys, voter surveys, and online surveys. The post-implementation evaluations that were completed were noted as especially useful in guiding decision makers, such as transit agency leadership or government officials, on whether to continue the program.

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## **Examples of Post-Implementation Evaluation**

Multiple surveyed transit agencies have continued to monitor ridership, transit agency operations, finances, and the community after implementation:

- **Area Regional Transit** (St. Lucie County, FL) evaluated its full fare-free transit (during a 3-year pilot) across various metrics including ridership, productivity, subsidy per passenger, and operating speed.
  - **Cache Valley Transit District** (Logan, UT) evaluates its fare-free policy every 5 years and looks at the qualitative and quantitative impacts of returning to fares.
  - **DASH** (Alexandria, VA) is conducting several customer surveys in the first year following implementation to gauge the impact of the new network and free fares.
  - **KCATA** (Kansas City, MO) is currently evaluating the community health benefits of the policy to leverage additional funding.
  - **Link Transit** (Wenatchee, WA) plans to evaluate the policy for effectiveness. Potential operational aspects the transit agency plans to consider include ridership, paratransit demand, and passenger conflicts.
  - **Mountain Line** (Missoula, MT) conducted a rider survey in the second year of the program to measure changes in ridership.
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POLICY

January 28, 2019

# Should Transit Be Free?


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BUSES

EQUITY

Free transit sounds like a utopian fever dream. Imagine being able to hopscotch your city on a bus, never again needing to fumble for your ticket, seeing the dreaded



Fare-free transit has lately been floated as a panacea for solving any number of society's ills, including climate change, congestion, and income inequality. Seattle City Council Member Kshama Sawant used the recent closure of the Alaska Way Viaduct to introduce her vision of free transit for everyone. In March, Luxembourg will become the first country to make transit free entirely, but the scheme is already at work in cities like Tallinn, Estonia and Dunkirk, France. To date, there are 97 (mostly small) cities and towns around the world with fully fare-free public transit. Enchanted by the possibilities, several US transit advocacy groups are calling for the elimination of fares.

But what does the research tell us? Should free transit be the end goal for advocates and policy-makers?

Transit agencies need money to run service, and major transit agencies in the US rely on fares for a substantial portion of their operating revenue. In New York, the \$4.5 billion the MTA receives in annual fare revenue comprises 50% of its operating budget. At the Chicago CTA, that percentage is 40%, and in San Francisco BART's is 62%. Eliminating fares means that revenue would need to come from somewhere else, and the federal government only provides very small transit agencies with operating assistance. Funding transit operations entirely by other measures (such as a tax on businesses) would be a heavy political lift, and hasn't been done in the US.

But let's say agencies did find other ways to subsidize operations. What effect would free transit have on ridership? Around the world, the verdict is still out on whether going fare free substantially changes people's travel choices. In Dunkirk, population 100,000, ridership increased by 85% immediately after the introduction of fare-free transit. But in Tallinn, population 426,000, ridership has only increased by 3% in the five years since transit was made free.

Ridership increasing is the desired outcome, but without sufficient revenue to increase service in response to new demand, agencies run the risk that riders will be



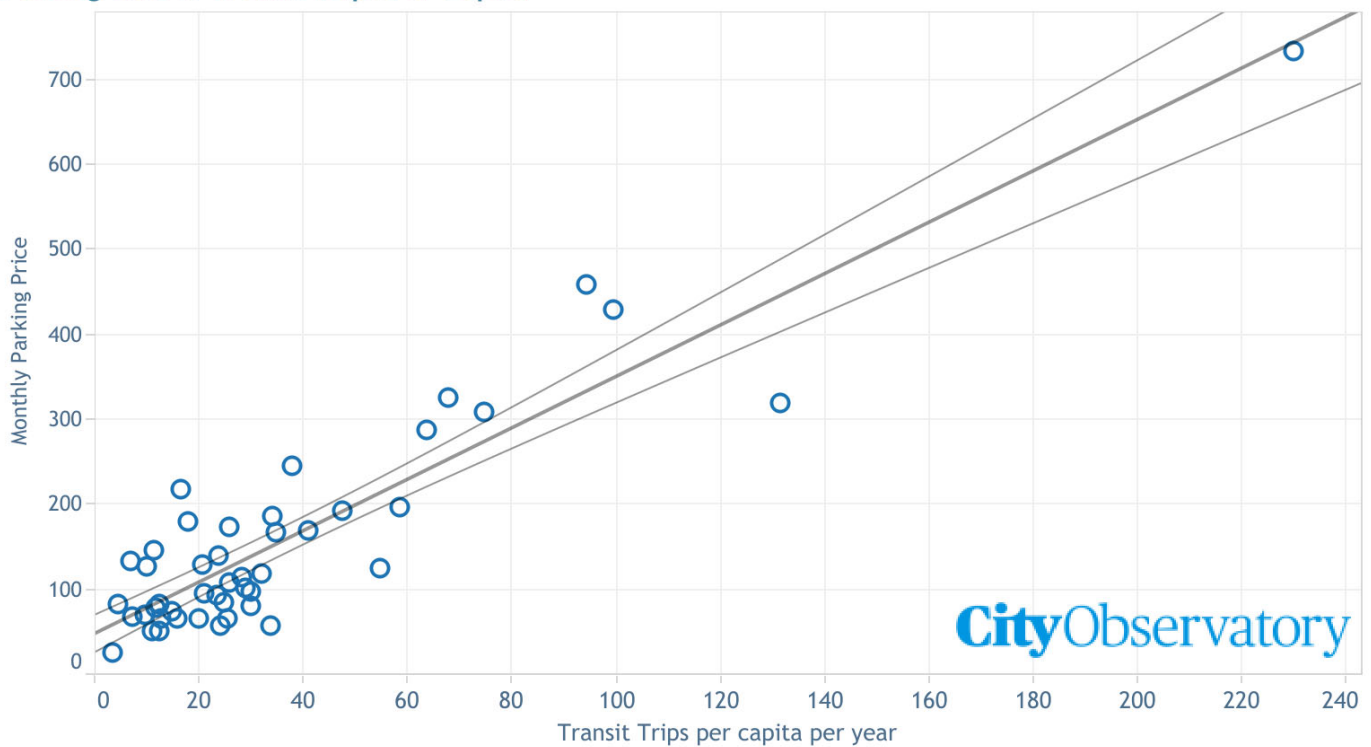
problems than they solved.

When researching our forthcoming report, *Who's on Board 2019*, we surveyed 1700 transit riders in seven different cities across the US. What we heard is that most low-income bus riders rate lowering fares as less important than improving the quality of the service. This suggests that if a transit agency had to choose between devoting funds to reducing fares or to maintaining or improving service, most riders would prefer the latter. The idea of making transit “free” turns out to be less appealing to the public than making improvements to transit.

What are superior and sustainable ways to move the needle on ridership? Making transit fast, frequent, and reliable. In just a few short years, Seattle has nearly tripled the number of people able to walk to frequent transit, and ridership continues to climb. Ridership has also been gaining in San Francisco, where SFMTA has an ongoing program to speed up buses. Cities like Austin, Richmond, and Columbus are redesigning their bus networks to better connect people to jobs, and seeing ridership growth as a result.

Raising the cost of driving also has a tremendous effect on transit ridership. Public transit ridership went up by 18% in London after the city enacted a toll on drivers entering the center city. And across the US, the cost of parking in central business districts tracks well with transit ridership, suggesting more people are willing to take transit if the price of parking goes up.





Shifting cultural norms around taking transit can also make a difference. Large numbers of middle class people riding transit in cities can change the abiding perception that transit is for poor people, and boost ridership overall. Thanks to Washington State’s 1991 Commute Trip Reduction Law, which makes large employers responsible for reducing traffic congestion, 83% of employers in Downtown Seattle subsidize their employees transit passes. Employer-funded passes provide transit agencies with a consistent source of revenue, and ensure that transit riders represent a cross section of society. In Los Angeles, where transit ridership has been plummeting, a recent program at NBCUniversal offered employees subsidized transit passes, provided incentives for taking transit, and matched “transit curious” riders up with experienced transit riders. Within six months, the percentage of people taking transit to work at NBC went from 19% to 59%.

Of course, ridership isn’t transit’s only goal – ensuring access is also critical. Fortunately there are ways to make transit affordable without disrupting revenue

... funded by increasing the price of monthly passes (which are often dramatically discounted) or through partnerships with municipalities. Austin's transit agency Capital Metro recently made transit free for children under 18, and there's no reason that transit agencies shouldn't do this across the board. TransitCenter research indicates that people form opinions about transit when they're young, and early exposure can lead to long term loyalty.

LA Metro CEO Phil Washington recently made waves when he proposed to "save mankind" by making transit free by enacting congestion pricing on roads across Los Angeles. According to Washington, the \$12 billion or so generated from congestion pricing could be used to fund transit investments "so major that buses could run every 90 seconds on many streets," among others. The proposal is in its infancy, and faces a bewildering number of obstacles. To date, no US city has enacted congestion pricing, and car dependent Los Angeles seems an unlikely first victory. But if free fares are appropriate at any big transit agency, it's probably at LA Metro. Metro's farebox recovery ratio is a mere 17%, and the average annual income of its riders is \$17,000. The agency could technically get by without fare revenue, but the scheme would only work if massive funding was injected into improving current service, rather than into splashy, long-term rail projects. Success would also require repurposing traffic and parking lanes on city streets so that buses could move freely.

Free transit makes for a terrific news hook. But the only way to see the full benefits of transit - like improved air quality, less congestion, and more vibrant cities is for people to actually start riding transit in substantial numbers. To this end, agencies should immediately make transit more accessible by offering discounts to riders who need them the most. More employers should be compelled, whether through penalty or incentive, to subsidize transit passes. But what advocates and policymakers should actually be focusing on is a multi-pronged approach to make driving less attractive, and undoing policies that make driving feel free. Cities and



feasible for most US cities, large metro areas with robust transit networks should start laying the groundwork. Funneling money from these pursuits directly into improving transit will yield precisely the type of benefits sought by proponents of free transit.

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## More Like This Post:

October 26, 2023



## On the Brink: Will WMATA's Progress Be Erased by 2024?

The experience of being a WMATA rider has substantially improved over the last 18 months, thanks to changes the agency has made like adding off-peak service and simplifying fares. Things are about to get even better with the launch of all-door boarding later this fall, overnight bus service on some lines starting in December, and an ambitious plan to redesign the Metrobus network. But all of this could go away by July 1, 2024.

[READ MORE](#)

September 18, 2023



## To Achieve Justice and Climate Outcomes, Fund These Transit Capital Projects

Transit advocates, organizers, and riders are calling on local and state agencies along with the USDOT to advance projects designed to improve the mobility of Black and Brown individuals at a time when there is unprecedented funding and an equitable framework to transform transportation infrastructure, support the climate, and right historic injustices.

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## NAPA VALLEY TRANSPORTATION AUTHORITY **COVER MEMO**

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### **SUBJECT**

Federal and State Legislative Update

### **STAFF RECOMMENDATION**

That the Napa Valley Transportation Authority (NVTA) Board receive the Federal Legislative update, State Legislative Update, and the State Bill Matrix.

### **EXECUTIVE SUMMARY**

The attached memos from Platinum Advisors summarizes recent federal and state legislative activities respectively.

### **FISCAL IMPACT**

None



## NAPA VALLEY TRANSPORTATION AUTHORITY

### Board Agenda Memo

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**TO:** Board of Directors  
**FROM:** Kate Miller, Executive Director  
**REPORT BY:** Kate Miller, Executive Director  
(707) 259-8634 / Email: [kmiller@nvta.ca.gov](mailto:kmiller@nvta.ca.gov)  
**SUBJECT:** Federal and State Legislative Update

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#### **RECOMMENDATION**

That the Napa Valley Transportation Authority (NVTA) Board receive the Federal Legislative update (Attachment 1), State Legislative Update (Attachment 2), and the State Bill Matrix (Attachment 3).

#### **BACKGROUND**

##### *Federal Update:*

The Department of Transportation awarded the Bay Area Rapid Transit District \$544.6 million for its \$2.2 billion/775 new passenger railcar project.

##### *State Update:*

The Department of Finance reported August receipts of \$710 million which is 5.5% higher than projections. Likewise in September, the general fund cash receipts were \$2.4 billion, 16% higher than the forecast. The fiscal year to date reflected revenues of \$7.3 billion above projections, of which \$3.2 billion is an accounting adjustment for revenues that were collected in the prior fiscal year.

The California State Transportation Agency opened the public comment period for the Climate Action Plan for Transportation Infrastructure (CAPTI) on November 1<sup>st</sup>. Comments will be accepted until December 13<sup>th</sup> and can be made by emailing [CAPTI@calst.ca.gov](mailto:CAPTI@calst.ca.gov).



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Proposed changes to the Air Resources Board's Advanced Clean Fleet Rule may have implications for public transit system vehicles currently not subject to the Innovative Clean Transit regulations. Those vehicles could include fleet vehicles, offroad vehicles such as forklifts, and heavy-duty vehicles such as tow trucks and utility trucks.

### Local and State Election Results

As of this writing, not all ballots have been counted and the election results have not been certified. The information below is based on the most recent results, and the final outcome may differ from what is currently being reported. Staff will provide an update at the Board meeting with any changes to the reported information below.

#### Local Ballot Measures:

Measure U – Measure U was placed on the ballot by the Napa Valley Transportation Authority-Tax Agency Board and will extend the existing ½ cent sales tax under Measure T through 2055. The Measure will also allow the agency to bond against future revenues in order to deliver projects sooner. The Measure also memorializes the distribution of revenues, will grant additional flexibility for jurisdictions to use up to 5% of their revenues for other transportation-related projects, will update the maintenance of effort provisions and active transportation requirements, will allow NVRTA to use up to \$56 million for highway improvements and emergency transportation programs, and will increase NVRTA's administrative revenues to 2%. Most of the funding (91.5%) will remain committed to maintain and rehabilitate local streets and road maintenance. The Measure would require a 2/3rds voter approval. The Measure is currently passing with 72% of the vote.

Measure B – Measure B is the Napa Valley Unified School District's general obligation bond proposal. The Measure requires a 55% voter approval and would raise \$230 million to upgrade school safety, security, and emergency response systems. It would further construct, upgrade and modernize aging schools, make American with Disabilities upgrades and make improvements and upgrades to other school facilities, such as parking, cafeteria and cooking facilities, heating and air conditioning equipment, and play yards and fields. The Measure is currently not passing by a slim margin with 53% of the voters supporting the Measure.

Measure G – is being placed on the ballot by the City of Napa and is a 1 cent permanent sales tax increase (7.75% to 8.75%). The Measure would raise \$22 million annually for City services including repairing potholes/streets, maintaining parks, recreation, senior/youth programs, protect water quality, support police and mental health response team for nonviolent calls; upgrade fire stations with lifesaving equipment. It would provide homeless encampment cleanup, construct essential facilities, enhance fire protection. The Measure is considered a general government use tax and therefore only requires 50% plus one vote for approval. The Measure is currently passing with 57% of the vote.

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Measures A1 and A2 – have been placed on the ballot by the City of St. Helena. A1 requests the voters’ approval to become a Charter City under a “limited” charter”, which is necessary to implement A2, which is a supplemental Real Property Transfer Tax of 1.5% to all sales between \$1 and \$5 million and 3% to all sales over \$5 million. The Real Property Transfer Tax would generate \$7 million a year and be used for maintaining public safety, improve the City’s sidewalk infrastructure. The Measures require a simple majority (50% plus 1) of the vote to pass. The Measures are currently not passing with 47% of voters supporting Measure A1 and 42% of the voters supporting Measure A2.

Measure B – placed on the ballot by “A group of local residents, with the support of Noble House Hotels & Resorts” to gain City of St. Helena voter support of the St. Helena Resort project. The Measure would amend the City’s General Plan and Zoning Code to permit development of a 56-room hotel and related public and visitor-serving amenities. The Measure would require a simple majority (50% plus 1) of the vote to pass. The Measure is not passing by a small margin with 49% of voters supporting the Measure.

State Ballot Measures:

Proposition 2: \$10 billion bond proposal to make improvements at K-12 schools and community colleges. Proposition 2 is currently passing with 56.9% of the vote.

Proposition 3: Reaffirm the right of same-sex couples to marry. This proposal would repeal the unconstitutional provisions in the Constitution that limits marriage to a man and a woman. Proposition 3 is currently passing with 61.0% of the vote.

Proposition 4: \$10 billion bond for climate programs. This bond proposal includes funding for a wide range of climate related improvements. However, it does not include any funding for zero emission vehicle programs. Proposition 4 is currently passing with 57.9% of the vote.

Proposition 5: Lower voter approval requirements for local housing bonds. This proposal includes the amendments proposed by ACA 1, and the amendments made by ACA 10. As it appears on the ballot, Proposition 5 would establish conditions whereby local housing bonds could be approved by 55% of the voters. Proposition 5 is not passing and receiving only 43.7% of the voters supporting the Proposition.

Proposition 6: Limit forced labor in state prisons. This proposal would amend the Constitution to prohibit the use involuntary servitude as a punishment for a crime. Proposition was not supported by the voters with only 45.1% of voters supporting the Proposition.

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Proposition 32: Raise the state minimum wage to \$18 an hour. This proposal would increase the minimum wage, and annually adjust the minimum wage based on inflation starting in 2026. Proposition 32 is not passing by a slim margin with 48.0% of the voters supporting increasing the minimum wage.

Proposition 33: Allow local governments to impose rent controls. This proposal would eliminate the Costa-Hawkins law, and allow local governments to control rents for any housing. This proposal does not affect any existing local rent control laws. California voters were overwhelmingly against this proposition with 61.5% voting no to allow local governments the ability to impose rent control. This sentiment was universally consistent where a no vote reflected the majority of voters among all counties in the State.

Proposition 34: Require certain health providers to use nearly all revenue from a federal prescription drug program on patient care. Proposition 34 creates new rules about how certain health care entities spend revenue from the federal drug discount program. Specifically, the entities would have to spend at least 98 percent of their net revenue earned in California on health care services provided directly to patients. Proposition 34 is passing with 51.5% of the vote.

Proposition 35: Make permanent a tax on managed health care insurance plans. Proposition 35 makes the existing health plan tax permanent beginning in 2027. The state would still need federal approval to charge the tax. Proposition 35 received a lot of support from voters and will pass with 66.8% of the vote.

Proposition 36: Increase penalties for theft and drug trafficking. Under this proposal people convicted of certain drug or theft crimes could receive increased punishment, such as longer prison sentences. In certain cases, people who possess illegal drugs would be required to complete treatment or serve up to three years in prison. California voters overwhelming supported Proposition 36 with 70.4% of the vote. The ballot succeeded in receiving a yes vote from the majority of voters in all 58 counties in California.

## **ATTACHMENTS**

- 1) November 1, 2024 Federal Update (Platinum Advisors)
- 2) November 1, 2024 State Update (Platinum Advisors)
- 3) November 1, 2024 State Bill Matrix

# PLATINUM | ADVISORS

TO: Kate Miller, Executive Director  
Napa Valley Transit Authority

FROM: Jessica Aune, Platinum Advisors

RE: Napa Valley Transit Authority October 2024 Monthly Report

DATE: Friday, November 1, 2024

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## **Political and Legislative Update**

Three months have passed since President Joe Biden formally announced he would not seek re-election, followed by a swift endorsement of Vice President Kamala Harris as the Democratic nominee. Since then, the race between VP Harris and former President Donald Trump has narrowed to a near-dead heat. Results in seven states – Nevada, Arizona, Wisconsin, Michigan, Pennsylvania, North Carolina, and Georgia – will largely determine the outcome of the election.

In recent days, both campaigns have delivered their final arguments to voters. VP Harris has worked to contrast herself with former President Trump, arguing that her administration will seek common ground across the political spectrum to pass legislation that would lower costs for working and middle-class Americans. Concurrently, Trump has presented a populist vision of a 'stronger America' characterized by new tariffs on imported goods and a more secure southern border.

The Harris campaign has focused her messaging during the final days of the campaign on democracy and reproductive health access while the Trump campaign hopes that frustrations with inflation and other economic pressures will drive certain historically left-leaning voters, including men of color, to vote for the former president.

Members of both Chambers also spent October on the campaign trail as control of both the House and Senate hangs in the balance. Democratic Leader Chuck Schumer and DSCC Chairman Gary Peters have a monumental task of protecting 23 Democratic incumbent members including seats in reliable red states such as Montana and Ohio as well as swing states including Arizona, Nevada, Wisconsin, Michigan and Pennsylvania. With Senator Manchin's retirement guaranteeing that Republicans will pick up a seat in West Virginia, it is anticipated that Republicans could gain control of the Senate in January 2025. Due to the most recent redistricting, there are limited competitive districts in the House and only 18 districts that President Biden won in 2020 currently held by Republicans. The road to the majority for Democrats will run through New York and California and they will need to make significant gains in those state to win the Speaker's gavel.

While it may take several days after Election Day to determine which party will control the White House, Senate, and House of Representatives, lawmakers will return to Capitol Hill the week of November 11 to complete work on government funding. In the wake of the destruction left behind by Hurricanes Helene and Milton, the Federal

Highway Administration (FHWA) has warned lawmakers that the agency's federal highway emergency fund is running on low levels. With hurricane season not over for another month and an increase in the destructive nature of natural disasters, Congress could have to bolster funding levels in its Transportation-HUD appropriations bill or a separate supplemental disaster relief bill. Lawmakers must also pass a short-term extension of Farm Bill programs set to expire at the end of the year and the annual National Defense Authorization Act.

### **Pending Legislation of Interest**

**[H.R.125](#) — To prohibit the imposition of mask mandates on public transportation.**

Sponsor: Biggs, Andy [Rep.-R-AZ-5]

Introduced: 1/9/2023

**[H.R.327](#) — To reduce the tax credit for new qualified plug-in electric drive motor vehicles by State subsidies for these vehicles.**

Sponsor: Estes, Ron [Rep.-R-KS-4]

Introduced: 1/12/2023

**[H.R.490](#) — To establish the Federal Infrastructure Bank to facilitate investment in, and the long-term financing of, economically viable U.S. infrastructure projects that provide a public benefit.**

Sponsor: Webster, Daniel [Rep.-R-FL-11]

Introduced: 1/24/2023

**[S.63](#) — A bill to adjust the effective date for application of certain amendments made with respect to the credit for new clean vehicles.**

Sponsor: Manchin, Joe, III [Sen.-D-WV]

Introduced: 1/25/202

**[H.R.495](#) — To amend the National Environmental Policy Act of 1969 to authorize assignment to States of Federal agency environmental review responsibilities.**

Sponsor: Calvert, Ken [Rep.-R-CA-41]

Introduced: 1/25/2023

**[H.R.852](#) — To direct the Attorney General to establish a grant program for civilian traffic violation enforcement.**

Sponsor: Rep. Torres, Ritchie [D-NY-15]

Introduced: 2/06/2023

**[H.R.873](#) — To authorize the Administrator of the Environmental Protection Agency to award grants and contracts for projects that use emerging technologies to address threats to water quality, and for other purposes.**

Sponsor: Rep. Donalds, Byron [R-FL-19]

Introduced: 2/08/2023

**S.352 — Highway Formula Modernization Act of 2023**

Sponsor: Kelly, Mark [Sen.-D-AZ]

Introduced: 2/09/2023

**H.R. 1500 – To establish a program to use anonymized data from third party entities to inform infrastructure planning decisions and improve transportation management capabilities.**

Sponsor: Graves, Garret [Rep.-R-LA-6]

Introduced: 3/09/2023

Status: Advanced from T&I Committee

**H.R.1665 — To direct the Secretary of Transportation to establish a program to provide grants to local governments to install publicly accessible safety charging stations for electric bicycles and scooters, and for other purposes.**

Sponsor: Velazquez, Nydia M. [Rep.-D-NY-7]

Introduced: 03/17/2023

**S.876 — A bill to establish a 90-day limit to file a petition for judicial review of a permit, license, or approval for a highway or public transportation project, and for other purposes.** Sponsor: Cruz, Ted [Sen.-R-TX]

Introduced: 03/21/2023

**H.R.1668 — To amend title 23, United States Code, with respect to the highway safety improvement program, and for other purposes.**

Sponsor: Blumenauer, Earl [Rep.-D-OR-3]

Introduced: 03/21/2023

**H.R.2664 —Transportation Innovation Coordination Act**

Sponsor: DelBene, Suzan K. [Rep.-D-WA-1]

Introduced: 04/18/2023

**H.R.3082 - MOBILE Act**

Sponsor: Cohen, Steve [D-TN-9]

Introduced: 05/05/2023

**S.1535 — A bill to require the Administrator of the Federal Aviation Administration to promulgate regulations to allow the transport of firefighters on board a covered aircraft operated on a mission to suppress a wildfire, and for other purposes.**

Sponsor: Kelly, Mark [Sen.-D-AZ]

Introduced: 05/10/2023

**H.R.3411 - To increase access to higher education by providing public transit grants.** Sponsor: Fitzpatrick, Brian K. [R-PA-1]

Introduced: 05/17/2023

[H.R.3468](#) — **To direct the Secretary of Energy to establish a grant program to facilitate electric vehicle sharing services operated at public housing projects, and for other purposes.** Sponsor: Barragan, Nanette Diaz [D-CA-44]  
Introduced: 05/18/2023

[H.R.3785](#) — **To amend title 23, United States Code, to require that public employees perform construction inspection work for federally funded highway projects, and for other purposes.**  
Sponsor: Rep. Garamendi, John [D-CA-8]  
Introduced: 06/01/2023

[H.R.3845](#) — **To amend title 23, United States Code, to increase accessible transportation for individuals with disabilities.**  
Sponsor: Titus, Dina [Rep.-D-NV-1]  
Introduced: 06/06/2023

[H.R.3896](#) — **To establish an airport infrastructure resilience pilot program.**  
Sponsor: Cohen, Steve [Rep.-D-TN-9]  
Introduced: 06/07/2023

[S.1929](#) — **A bill to direct the Administrator of the Federal Aviation Administration to provide progress reports on the development and implementation of the national transition plan related to a fluorine-free firefighting foam, and for other purposes.**  
Sponsor: Peters, Gary C. [Sen.-D-MI]  
Introduced: 06/12/2023

[S.1946](#) — **A bill to amend title 49, United States Code, to allow the owner or operator of a small hub airport that is reclassified as a medium hub airport to elect to be treated as a small hub airport, and for other purposes.**  
Sponsor: Sen. Blackburn, Marsha [R-TN]  
Introduced: 06/13/2023

[S.2075](#) — **A bill to amend the Infrastructure Investment and Jobs Act to modify the Safe Streets and Roads for All program.**  
Sponsor: Fetterman, John [Sen.-D-PA]  
Introduced: 06/21/2023

[S.Res.274](#) — **A resolution expressing the sense of the Senate to reduce traffic fatalities to zero by 2050.**  
Sponsor: Blumenthal, Richard [Sen.-D-CT]  
Introduced: 06/22/2023

[H.R.4598](#) — **To provide for disadvantaged business enterprise supportive services programs at modal administrations of the Department of Transportation, and for other purposes.**

Sponsor: Aguilar, Pete [Rep.-D-CA-33]

Introduced: 07/13/2023

[H.R.4621](#) — **To improve the environmental review process for highway projects through the use of interactive, digital, cloud-based platforms, and for other purposes.**

Sponsor: Johnson, Dusty [R-SD-At Large]

Introduced: 07/13/2023

[H.R.4636](#) — **To direct the Secretary of Transportation to establish a Wireless Electric Vehicle Charging Grant Program, and for other purposes.**

Sponsor: Stevens, Haley M. [Rep.-D-MI-11]

Introduced: 07/14/2023

[H.R.4728](#) — **To amend title 49, United States Code, to provide for free public transportation for individuals who are recently released from incarceration.**

Sponsor: Cleaver, Emanuel [Rep.-D-MO-5]

Introduced: 07/20/2023

[H.R.4857](#) — **Equitable Transit Oriented Development Support Act**

Sponsor: DeSaulnier, Mark [Rep.-D-CA-10]

Introduced: 07/25/2023

[S.2480](#) — **CHARGE Act of 2023**

Sponsor: Markey, Edward J. [Sen.-D-MA]

Introduced 07/25/2023

[H.R.4908](#) — **Expedited Federal Permitting for California Act**

Sponsor: Garamendi, John [Rep.-D-CA-8]

Introduced: 07/26/2023

[H.R.4982](#) — **Tolling Transparency Act of 2023**

Sponsor: Chavez-DeRemer, Lori [Rep.-R-OR-5]

Introduced: 07/27/2023

[H.R.5154](#) — **CHARGE Act of 2023**

Sponsor: Ocasio-Cortez, Alexandria [Rep.-D-NY-14]

Introduced: 08/04/2023

[H.R.5242](#) — **CONNECT Act of 2023**

Sponsor: Pettersen, Brittany [Rep.-D-CO-7]

Introduced: 08/18/2023



**H.R.5359 — Rural Development Modernization Act**

Sponsor: Costa, Jim [Rep.-D-CA-21]

Introduced: 09/08/2023

**[H.R.5437](#) — Protecting Infrastructure Investments for Rural America Act**

Sponsor: Finstad, Brad [Rep.-R-MN-1]

Introduced: 09/13/2023

**[S.2855](#) — A bill to modernize and streamline the permitting process for broadband infrastructure on Federal land, and for other purposes.**

Sponsor: Barrasso, John [Sen.-R-WY]

Introduced: 09/20/2023

**[H.R.5656](#) — To amend the Internal Revenue Code of 1986 to provide a tax credit for new off-road plug-in electric vehicles.**

Sponsor: Phillips, Dean [Rep.-D-MN-3]

Introduced: 09/21/2023

**[S.2882](#) — Stop EV Freeloading Act**

Sponsor: Fischer, Deb [Sen.-R-NE]

Introduced: 09/21/2023

**[H.R.5859](#) — To direct the Secretary of Transportation to establish a program to provide grants to protection and advocacy systems to advocate for individuals with disabilities to access transportation, and for other purposes.**

Sponsor: Wilson, Frederica S. [Rep.-D-FL-24]

Introduced: 09/29/2023

**[H.R.5980](#) — To amend title 49, United States Code, to authorize state of good repair grants to be used for public transportation resilience improvement, and for other purposes.**

Sponsor: Espaillat, Adriano [Rep.-D-NY-13]

Introduced: 10/18/2023

**[S.3080](#) — Resilient Transit Act of 2023**

Sponsor: Gillibrand, Kirsten E. [Sen.-D-NY]

Introduced: 10/18/2023

**[H.R.6178](#) — Bidirectional Electric Vehicle Charging Act of 2023**

Sponsor: Brownley, Julia [Rep.-D-CA-26]

Introduced: 11/02/2023

**[H.R.6199](#) — Build More Housing Near Transit Act of 2023**

Sponsor: Peters, Scott H. [Rep.-D-CA-50]

Introduced: 11/02/2023

**[S.3216](#) — Build More Housing Near Transit Act of 2023**

Sponsor: Schatz, Brian [Sen.-D-HI]

Introduced: 11/02/2023

**S.3246 — Building Safer Streets Act**

Sponsor: Fetterman, John [Sen.-D-PA]

Introduced: 11/07/2023

**H.R.6376 — To require certain grant recipients of transit and highway transportation projects to establish and contribute to a business uninterrupted monetary program fund, and for other purposes.**

Sponsor: Correa, J. Luis [Rep.-D-CA-46]

Introduced: 11/13/2023

**H.R.6665 — To amend the Internal Revenue Code of 1986 to eliminate certain fuel excise taxes and impose a tax on greenhouse gas emissions to provide revenue for maintaining and building American infrastructure, and for other purposes.**

Sponsor: Fitzpatrick, Brian K. [Rep.-R-PA-1]

Introduced: 12/07/2023

**S.3477 — A bill to increase access to higher education by providing public transit grants.** Sponsor: Casey, Robert P., Jr. [Sen.-D-PA]

Introduced: 12/12/2023

**H.R.6964 — To establish limitations on advanced payments for bus rolling stock, and for other purposes.**

Sponsor: Fischbach, Michelle [Rep.-R-MN-7]

Introduced: 01/11/2024

**H.R.6997 — Disaster Contract Improvement Act**

Sponsor: LaLota, Nick [Rep.-R-NY-1]

Introduced: 01/16/2024

**S.3605 — A bill to require the Secretary of Transportation to develop guidelines and best practices for local evacuation route planning, and for other purposes.**

Sponsor: Padilla, Alex [Sen.-D-CA]

Introduced: 01/17/2024

**H.R.7009 — Securing Airport Facilities for Enhanced Parking Act**

Sponsor: Caraveo, Yadira [Rep.-D-CO-8]

Introduced: 01/17/2024

**H.R.7012 — Transit Emergency Relief Act**

Sponsor: D'Esposito, Anthony [Rep.-R-NY-4]

Introduced: 01/17/2024

**H.R.7039 — To amend title 49, United States Code, to establish a program to provide grants to eligible recipients for eligible operating support costs of public transportation, and for other purposes.**

Sponsor: Johnson, Henry C. "Hank," Jr. [Rep.-D-GA-4]

Introduced: 01/18/2024

[H.R.7191](#) — **Save Our Pedestrians Act of 2024**

Sponsor: Carey, Mike [Rep.-R-OH-15]

Introduced: 02/01/2024

[H.R.7273](#) — **UNPLUG EVs Act**

Sponsor: Burlison, Eric [Rep.-R-MO-7]

Introduced: 02/07/2024

[H.R.7286](#) — **GREEN Streets Act**

Sponsor: Huffman, Jared [Rep.-D-CA-2]

Introduced: 02/07/2024

[H.R.7504](#) — **To expand and modify the grant program of the Department of Veterans Affairs to provide innovative transportation options to veterans in highly rural areas, and for other purposes.**

Sponsor: Perez, Marie Gluesenkamp [Rep.-D-WA-3]

Introduced: 02/29/2024

[H.R.7548](#) — **Small Business Transportation Investment Act of 2024**

Sponsor: Miller, Carol D. [Rep.-R-WV-1]

Introduced: 03/05/2024

[S.3924](#) — **Bus Rolling Stock Modernization Act of 2024**

Sponsor: Smith, Tina [Sen.-D-MN]

Introduced: 03/12/2024

[H.R.7980](#) — **End Chinese Dominance of Electric Vehicles in America Act of 2024**

Sponsor: Miller, Carol D. [Rep.-R-WV-1]

Introduced: 04/15/2024

Latest Action: House - 04/17/2024 Ordered to be Reported in the Nature of a Substitute

(Amended) by the Yeas and Nays: 22 - 18.

[H.R.8121](#) — **To amend the Intermodal Surface Transportation Efficiency Act of 1991 to prohibit congestion or cordon pricing in a value pricing program, and for other purposes.** Sponsor: Malliotakis, Nicole [Rep.-R-NY-11]

Introduced: 04/23/2024

[H.R.8253](#) — **To establish a green transportation infrastructure grant program, and for other purposes.**

Sponsor: Garcia, Robert [Rep.-D-CA-42]

Introduced: 05/06/2024

[S.4277](#) — **A bill to establish a green transportation infrastructure grant program, and for other purposes.**

Sponsor: Warren, Elizabeth [Sen.-D-MA]

Introduced: 05/07/2024

[S.4299](#) — **A bill to require the Secretary of Transportation to issue a rule relating to the collection of crashworthiness information under the New Car Assessment Program of the National Highway Traffic Safety Administration, and for other purposes.**

Sponsor: Fischer, Deb [Sen.-R-NE]

Introduced: 05/09/2024

[S.4316](#) — **Moving Transit Forward Act of 2024**

Sponsor: Van Hollen, Chris [Sen.-D-MD]

Introduced: 05/09/2024

Latest Action: Senate - 07/31/2024 Committee on Banking, Housing, and Urban Affairs. Hearings held.

[H.R.8349](#) — **To establish the position of National Roadway Safety Advocate within the Department of Transportation, and for other purposes.**

Sponsor: Cohen, Steve [Rep.-D-TN-9]

Introduced: 05/10/2024

[H.R.8357](#) — **To provide that not less than 3 percent of the amounts made available for certain Federal-aid highway programs shall be expended through veteran owned small business concerns, and for other purposes.**

Sponsor: Kim, Andy [Rep.-D-NJ-3]

Introduced: 05/10/2024

[H.R.8486](#) — **To direct the Secretary of Transportation, in coordination with the Secretary of Housing and Urban Development, to establish a thriving communities grant program.** Sponsor: Torres, Norma J. [Rep.-D-CA-35]

Introduced: 05/21/2024

[S.4389](#) — **A bill to amend the Internal Revenue Code of 1986 to promote the increased use of renewable natural gas, to reduce greenhouse gas emissions and other harmful transportation-related emissions that contribute to poor air quality, and to increase job creation and economic opportunity throughout the United States.**

Sponsor: Tillis, Thomas [Sen.-R-NC]

Introduced: 05/22/2024

[S.4422](#) — **A bill to require original equipment manufacturers of digital electronic equipment to make available certain documentation, diagnostic, and repair information to independent repair providers, and for other purposes.**

Sponsor: Lujan, Ben Ray [Sen.-D-NM]

Introduced: 05/23/2024

[H.R.8737](#) — **To amend the Infrastructure and Investment and Jobs Act to repeal the authority of the Secretary of Energy and the Secretary of Transportation to maintain an electric vehicle working group, and for other purposes.**

Sponsor: Ogles, Andrew [Rep.-R-TN-5]

Introduced: 06/13/2024

[S.4989](#) — **RECHARGE Act**

Sponsor: Merkley, Jeff [Sen.-D-OR]

Introduced: 08/01/2024

[H.R.9408](#) — **Pedestrian Protection Act**

Sponsor: Scanlon, Mary Gay [Rep.-D-PA-5]

Introduced: 08/23/2024

[H.R.9531](#) — **To make projects in certain counties eligible for funding under the rural surface transportation grant program, and for other purposes.**

Sponsor: Valadao, David G. [Rep.-R-CA-22]

Introduced: 09/10/2024

[H.R.9536](#) — **To amend title 23, United States Code, and the Infrastructure Investment and Jobs Act with respect to vehicle roadside accidents, and for other purposes.**

Sponsor: Carter, Troy A. [Rep.-D-LA-2]

Introduced: 09/11/2024

[S.5038](#) — **Stop CARB Act of 2024**

Sponsor: Lee, Mike [Sen.-R-UT]

Introduced 09/12/2024

[H.R.9574](#) — **To amend the Clean Air Act to eliminate a waiver under that Act, to eliminate an authorization for States to use new motor vehicle emission and new motor vehicle engine emissions standards identical to standards adopted in California, and for other purposes.** Sponsor: Nehls, Troy E. [Rep.-R-TX-22]

Introduced: 09/12/2024

[H.R.9652](#) — **To incentivize innovative transportation corridors to reduce carbon and GHG emissions, to provide a tax structure that allows for certain investments in public transportation systems, and to enable the fossil fuel workforce to transition to sustainable work sectors.**

Sponsor: DeSaulnier, Mark [Rep.-D-CA-10]

Introduced: 09/18/2024

[H.R.9888](#) — **To direct the Secretary of Transportation to update guidance for the National Electric Vehicle Infrastructure Formula Program to increase the flexibility of States related to the location of electric vehicle charging infrastructure, and for other purposes.**

Sponsor: Trone, David J. [Rep.-D-MD-6]

Introduced: 09/27/2024

[H.R.10051](#) — **Driver Technology and Pedestrian Safety Act of 2024**

Sponsor: Mullin, Kevin [Rep.-D-CA-15]

Introduced: 10/25/2024

## **Executive Branch**

### **Department of Transportation (DOT)**

DOT [announced](#) a \$544.6 million loan through the Build America Bureau to the San Francisco Bay Area Rapid Transit District (BART) for 775 new passenger railcars. The new railcars are part of a \$2.2 billion expansion and upgrade of the entire BART system.

DOT [announced](#) more than \$4.2 billion in funding through two major discretionary grant programs, the National Infrastructure Project Assistance (Mega) grant program and the Infrastructure for Rebuilding America (INFRA) grant program. A total of 44 projects were selected in this round of funding, including projects that improve safety, mobility, and economic competitiveness, constructing major bridges, expanding port capacity, redesigning interchanges, and more.

### **Federal Transit Administration (FTA)**

FTA [announced](#) that the University of Cincinnati will receive approximately \$5.1 million to promote the adoption of digital platforms that speed up and improve the delivery of transit construction projects while reducing costs. Funded by the Bipartisan Infrastructure Law, the program will test digital systems that manage the entire construction life cycle of transit infrastructure projects, leading to increased efficiency and improved project outcomes.

FTA [announced](#) an \$84.9 million grant award to the city of Rochester, Minnesota, to build faster, more reliable, all-electric bus service in the city. With seven stations, the 2.8-mile bus rapid transit (BRT) Link will operate along more than half of the route in dedicated bus-only lanes and receive priority at traffic lights for the remainder of the route.

FTA [finalized](#) Bipartisan Infrastructure Law requirements allowing State Safety Oversight Agencies (SSOAs) to conduct inspections of rail transit agencies without warning and requiring SSOAs to include inspection programs in their program standards and collect metrics and data that better explain rail transit safety.

FTA [announced](#) a \$149.9 million grant award to the Regional Transportation District (RTD) in Denver, Colorado, a major step forward for the agency's plans to build a bus rapid transit (BRT) line along one of the city's busiest corridors. The 8.6-mile BRT line aims to improve the experience for transit riders with several miles of dedicated bus-only lanes, traffic lights that will automatically turn green for buses, and faster boarding.

### **Federal Highway Administration (FHWA)**

FHWA [announced](#) more than \$96.5 million in grants to 16 states for 20 projects under the Advanced Transportation Technology and Innovation (ATTAIN) program. The grants will fund technology-based and multimodal solutions that improve the travel experience for millions of Americans who use our highway and transit systems, including in disadvantaged communities that have lacked investment and resources.

### **Federal Aviation Administration (FAA)**

FAA [announced](#) \$970 million through the Bipartisan Infrastructure Law to 125 U.S. airports, including funding for new baggage systems, larger security checkpoints, increasing gate capacity, and modernizing aging infrastructure throughout terminals and ground transportation.

### **Build America Bureau**

The Build America Bureau [issued](#) a Notice of Funding Opportunity (NOFO) announcing the availability of up to \$10 million in grants for participants in the Regional Infrastructure Accelerators Program (RIA). The program funds technical resources, planning, and project development to expedite regional transportation infrastructure through innovative financing and delivery methods, including public-private partnerships.

### **Joint Office of Energy and Transportation (Joint Office)**

The Joint Office [announced](#) the opening of the nation's first Electric Vehicle Charger Reliability and Accessibility (EVC-RAA) funded electric vehicle (EV) charging project in Blue Earth, Minnesota. The EVC-RAA funds were used to upgrade a previous fast charger to a higher power level charger with one Combined Charging System connector and one CHAdeMO port. The EVC-RAA grant program has made nearly \$150 million available for American communities to repair roughly 4,500 existing EV charging ports as a part of a White House-led goal of having 500,000 EV chargers in the ground and operating by 2030.

# PLATINUM | ADVISORS

November 1, 2024

TO: Kate Miller, Executive Director  
Napa Valley Transportation Authority

FR: Steve Wallauch  
Platinum Advisors

**RE: Legislative Update**

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**Fiscal Outlook:** The Department of Finance’s monthly revenue bulletins continue to illustrate a stable fiscal outlook. The month of August receipts were \$710 million, or 5.5 percent, above the Budget Act forecast for August. In September, General Fund cash receipts were \$2.4 billion, or 16 percent, above the Budget Act forecast. This overage was driven by quarterly personal income tax and corporation tax payments which were \$1.8 billion and \$557 million higher, respectively.

For the fiscal year to date, General Fund cash receipts were \$7.3 billion above projections, but this includes an accounting correction of \$3.2 billion attributed to cash collected during the 2023-24 fiscal year. These higher revenue numbers contributed to the Governor’s confidence when he announced expanding California Film & Television Tax Credit Program from \$330 million to \$750 million annually.

The next big step on the state’s fiscal outlook is the release of the LAO’s budget update and outlook that will be released sometime in November.

**CAPTI:** CalSTA opened the public comment period on the proposed revisions to the Climate Action Plan for Transportation Infrastructure (CAPTI). Comments can be submitted from November 1<sup>st</sup> to December 13<sup>th</sup> by emailing [CAPTI@calsta.ca.gov](mailto:CAPTI@calsta.ca.gov). The revised plan will be finalized in early 2025, and will reflect the first updated to CAPTI since it was adopted in July 2021.

While the update is still subject to public comment, among the proposed amendments to CAPTI include the following:

- Commits Caltrans to the development and release of the Statewide Express Mobility Plan, in consultation with the Roadway Pricing Working Group and the Equity Advisory Committee. The Plan will outline the role of roadway pricing and include a clear roadmap for expanding facilities-based pricing mechanisms.



- If funding is secured Caltrans will develop a prioritization methodology for climate adaptation projects currently identified in Caltrans District plans. If Caltrans is successful in receiving funds, Caltrans will work with regional partners and stakeholders to develop the methodology. Caltrans will also continue its work to meet its climate change adaptation performance objectives to be identified in the upcoming 2024-2028 update to the Caltrans Strategic Management Plan. These objectives include decreasing closures on the State Highway System associated with climate impacts.
- Commits CalSTA and GO-Biz (California Governor’s Office of Business and Economic Development) to establish a Central Delivery Team to support zero-emission freight infrastructure planning and implementation, including carrying out the actions identified in the California Transportation Commission’s (CTC’s) Clean Freight Corridor Efficiency Assessment.
- Create a statewide VMT mitigation bank or exchange program. This new action commits the Governor’s Office of Land Use and Climate Innovation (LCI) to explore creating a statewide exchange or bank and to create guidance and technical assistance that will support local and regional agencies in creating mitigation exchanges and banks at a regional or local level.

**Transit Exemption:** The California Air Resources Board (CARB) is developing several “targeted” changes to the Advanced Clean Fleet Rule. While the rule already includes language exempting transit operators that are subject to the Innovative Clean Transit Rule until 2030, CARB staff is proposing to revise the existing exemption language. CARB is expected to adopt the revisions at a meeting early next year.

CARB staff is seeking comments from transit operators on the proposed changes that are intended to clarify the application of the exemption. Under the current rule, the transit exemption is stated as follows:

*Transit agencies subject to the Innovative Clean Transit regulations commencing with title 13, CCR, section 2023 are not subject to any section of this article until January 1, 2030.*

In amending the rule, CARB is proposing to amend the exemption language as follows:

*Any vehicle that meets the criteria specified in section 2013(t)(1) or (2) below that are owned by transit agencies subject to the Innovative Clean Transit regulations commencing with title 13, CCR, section 2023 is not subject to any section of this article until January 1, 2030:*

*1. Vehicles that directly support and maintain transit service operations a majority of the time; or*

*2. Vehicles that provide transit passenger transportation services a majority of the time.*

If NVTA has any questions, comments, or concerns about this proposed amendment, please let me know, and we can schedule a meeting with CARB staff to discuss.

# PLATINUM | ADVISORS

November 1, 2024

ATTACHMENT 3  
 NVTA Board Item 11.5  
 November 20, 2024

**TABLE 1: BOARD ADOPTED POSITIONS**

	Subject	Status	Board Position
<p><b>AB 817</b>  <b>(Pacheco D)</b>                      Open meetings:                      teleconferencing:                      subsidiary body</p>	<p>AB 817 would authorize a “subsidiary body” to remotely hold a public meeting if specified conditions are met.</p> <p><i>AB 817 failed passage in the Senate Local Government Committee because the author would not accept all the amendments proposed by the Committee. Reconsideration of the bill was granted in the event the author changes her mind.</i></p> <p>The Committee proposed several amendments to narrow the application of the bill to specific types of advisory bodies, which the author accepted. However, there were two amendments the author would not accept. This resulted in the chair voting “no” causing the rest of the committee to hold off, or vote no. The two changes that are holding up this bill include the following:</p> <ul style="list-style-type: none"> <li>• The provisions of the bill would not apply to advisory bodies where the members are compensated.</li> <li>• Require a quorum to be present at a single public location; however, members of the body that have “specific needs” may count toward the quorum even if they participate remotely.</li> </ul>	<p>Senate Local Government</p> <p>Failed Passage</p> <p>Dead</p>	<p>SUPPORT</p>
<p><b>AB 1837</b>  <b>(Papan D)</b>                      San Francisco Bay area: public transportation.</p>	<p>AB 1837 remains in the Senate Transportation Committee and will not be moving forward this year.</p> <p>This bill would codify the existing Regional Network Manager Council that consists of specified Bay Area transit general managers. The bill would require MTC to create a council consisting of 11 representatives that would</p>	<p>Senate Transportation</p> <p>Dead</p>	<p>Watch</p>

	<b>Subject</b>	<b>Status</b>	<b>Board Position</b>
	<p>consist of the general managers from the large operators plus 4 additional general managers selected by specified general managers.</p> <p>The bill charges the Council to represent the interests of its stakeholders, provide critical input on regional transit policies, and provide guidance on regional transit policies and plans.</p>		
<p><b><u>AB 1904</u></b> <b>(Ward D)</b> Transit buses: yield right-of-way sign.</p>	<p>Existing law allows Santa Clara VTA and Santa Cruz Metropolitan Transit District to equip buses with a “yield right-of-way” sign to inform motorists when the bus re-entering a traffic lane.</p> <p>AB 1904 would expand the above authorization to allow any transit operators to equip its bus with yield right-of-way signs. Under AB 1904 these signs could be an illuminated sign or a static decal.</p>	<p><b>Signed Into Law</b> <b>Chapter #555,</b> <b>Statutes of 2024</b></p>	Support
<p><b><u>AB 2719</u></b> <b>(Wilson D)</b> Vehicles: commercial vehicle inspections.</p>	<p>AB 2719 was approved unanimously by the Assembly Committee on Transportation.</p> <p>This bill creates an alternative safety inspection process for public transit vehicles to ensure their safety and maintains the transit agency's ability to provide reliable, on-time transit service.</p> <p>AB 2719 is sponsored by NVRTA and SolTrans. The purpose of this bill is to create an alternative inspection process that will exempt public transit buses from being required to stop at any roadside inspection station.</p>	<p>Assembly Appropriations</p> <p>Held on Suspense File</p> <p>Dead</p>	Co-Sponsor
<p><b><u>AB 2824</u></b> <b>(McCarty D)</b> Battery; Public Transportation Provider</p>	<p>As amended, AB 2824 would expand the application of existing provisions for battery of a bus operator to also include an agent, employee, or contractor to a public transit operator. The existing penalty for battery includes a fine of up to \$10,000, or up to one year in county jail, or both. The bill would also include imprisonment in state prison for up to 16 months, or 2 years, or 3 years.</p>	<p>Assembly Public Safety</p> <p>Dead</p>	Support

	<b>Subject</b>	<b>Status</b>	<b>Board Position</b>
	AB 2824 will not move forward this year. The author and the sponsors could not reach an agreement on adding provisions to the bill to allow transit operators to issue prohibition orders.		
<b>AB 3214</b> <b>(Fong, Mike D)</b> Public transit: advertising.	AB 3214 would require the state to prioritize purchasing advertising space offered by public transit operators when implementing a public awareness campaign.  This measure will not move forward this year. The author and sponsors will pursue an administrative solution before seeking legislation.	Assembly Transportation  Dead	Support
<b>SB 537</b> <b>(Becker D)</b> City and County of Los Angeles: memorial to forcibly deported Mexican Americans and Mexican immigrants.	SB 537 was removed from the Inactive File and then gutted and amended. As amended, the bill would grant permission to construct a memorial on state property in Los Angeles.  The prior version of the bill provided some flexibility for remote participation in public meetings by multi-jurisdictional, cross-county local agencies with appointed members. These provision have been removed.	Signed Into Law Chapter #859, Statutes of 2024	WATCH  (prior version)
<b>SB 769</b> <b>(Gonzalez D)</b> Local government: fiscal and financial training	SB 769 would require, if a local agency provides any type of compensation, or expense reimbursement to members of its legislative body, to provide the members of the legislative body at least two hours of fiscal and financial training at least once every two years.  Fiscal and financial training is defined to include the following: <ul style="list-style-type: none"> <li>• Laws and principles relating to financial administration and short-and long-term fiscal management,</li> <li>• Laws and principles relating to capital financing and debt management, pensions and other postemployment benefits, and cash management and investments.</li> </ul>	Assembly Appropriations  Held on Suspense File  Dead	Watch

	<b>Subject</b>	<b>Status</b>	<b>Board Position</b>
	<ul style="list-style-type: none"> <li>General fiscal and financial planning principles and any pertinent laws relevant to the local agency official's public service and role in overseeing the local agency's operations.</li> </ul>		
<b>SB 925</b> <b>(Wiener D)</b> San Francisco Bay area: local revenue measure: transportation improvements.	<p>SB 925 was a spot bill that included intent language stating that this bill would authorize MTC to propose a revenue measure to fund the operation, expansion, and transformation of the public transportation system, and other transportation improvements.</p> <p>SB 1031 later became the vehicle for the regional funding measure. SB 925 was amended to address the sale of goods in public spaces in San Francisco.</p>	Assembly Appropriations  Held of Suspense File  Dead	Watch  (prior version)
<b>SB 926</b> <b>(Wahab D)</b> San Francisco Bay area: public transportation.	<p>SB 926 directs CalSTA to develop a plan to consolidate all transit operations in the Bay Area. The content of this bill has been added to SB 1031.</p>	Senate Transportation  Dead	Watch
<b>SB 947</b> <b>(Seyarto R)</b> Department of Transportation: state highway projects: agreements with public entities: project design changes.	<p>SB 947 would add to the project cost agreement between a local entity and Caltrans a requirement making Caltrans responsible for any additional costs associated with a new project design adopted by Caltrans after the project is included in the state transportation improvement program or the state highway operation and protection program.</p>	Senate Transportation  Dead	Watch
<b>SB 960</b> <b>(Wiener D)</b> Transportation: planning: transit priority projects: multimodal.	<p>SB 960 would place in statute the requirement for Caltrans to include "complete street" improvements to transportation projects.</p> <p>The bill was amended on July 3<sup>rd</sup> to reflect suggested changes by Caltrans. While the amendments provide some flexibility to Caltrans to phase in these requirements, the overall intent of the bill remains in place. Caltrans suggesting amendments bodes well for SB 960 being signed into law.</p>	<b>Signed Into Law</b> <b>Chapter 630,</b> <b>Statutes of</b> <b>2024</b>	Support

	Subject	Status	Board Position
	<p>This bill also requires inclusion of bicycle, pedestrian, and transit priority facilities in the Transportation Asset Management Plan, the State Highway System Management Plan, and the plain language performance report of the State Highway Operation and Protection Program (SHOPP). This bill requires any project in the SHOPP to include bicycle, pedestrian, and transit priority projects unless a specified exception applies.</p>		
<p><b>SB 1031</b> <b>(Wiener D)</b> San Francisco Bay area: local revenue measure: transportation improvements.</p>	<p>Given growing debate over the content of the bill, Senators Wiener and Wahab decided to shelve the bill for this year in order to provide more time to develop a consensus measure that will be introduced next session.</p> <p>SB 1031 enacts the Connect Bay Area Act, which authorizes MTC to impose specified taxes to fund transportation improvements in the San Francisco Bay Area. The bill also grants MTC the authority to condition the allocation of this revenue to transit operators, and the bill directs CalSTA to study the potential consolidation of transit operators or specific functions of transit operators.</p> <p>The goal of SB 1031 is to create a path to long-term operational stability for Bay Area transit systems, while also investing in transit capital needs and in our roads.</p>	<p>Assembly Desk</p> <p>Dead</p>	<p>Support</p>