ANCHORAGE SCHOOL DISTRICT

Purchasing Department
4919 Van Buren Street
Anchorage, AK 99517-3137

REQUEST FOR PROPOSAL

THIS IS NOT AN ORDER

Show the following on the outside of the sealed proposal envelope: **RFP 2026-602 PROFESSIONAL SERVICES CP&C AND M&O TIER 2/3 SEISMIC EVALUATION**	ISSUED DATE: **July 16, 2025**	DUE: **Prior to 10:00 a.m., Local Time** DATE: **August 6, 2025**

The Anchorage School District (referred to as the "District" or the "ASD") invites sealed proposals from qualified persons/firms to **PERFORM A TIER 2/3 SEISMIC EVALUATION OF THE FACILITIES SUPPORT CENTER (CP&C AND M&O DEPARTMENTS)** to the District in accordance with the following documents that are a part of this RFP 2026-602:

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Section II	Evaluation of Proposals	Page(s) 14 – 15
Section III	Proposal Format	Page(s) 16 – 17
Section IV	Specifications and Scope of Services	Page(s) 18 – 21
Attachment A	Proposal Transmittal Form	1 Page
Attachment B	Sample Professional Services Agreement (PSA)	4 Pages
Attachment C	Seismic Evaluation and Retrofit Guide for Existing Anchorage School District Buildings	33 Pages
Attachment D	Capital Planning and Construction (CP&C) ASCE 41 – Tier 1 Evaluation	131 Pages
Attachment E	CP&C and M&O Floor Plan	2 Pages
Attachment F	Offeror's Checklist	1 Page
Exhibit 1	Supplemental Terms, Conditions and Forms	7 Pages
Exhibit 2	Disadvantaged Business Enterprises Contract Participation Form	2 Pages
Exhibit 3	Disadvantaged Business Enterprises Prime Consultant/Contractor Certification	1 Page
Exhibit 4	Disadvantaged Business Enterprises Contact Documentation Form	1 Page
Special Provisions	Disadvantaged Business Enterprise Program Program Specifications for District Contracts	5 Pages

THIS RFP HAS FEDERAL GRANT REQUIREMENTS (DISADVANTAGED BUSINESS ENTERPRISE (DBE) PROGRAM PARTICIPATION REQUIREMENTS).

DBE PARTICIPATION REQUIREMENTS MUST BE COMPLETED BY THE PROPOSAL SUBMISSION DATE.

AVAILABILITY OF RFP: This Request for Proposals (.pdf) is available electronically at the District's Purchasing website: https://www.asdk12.org/Page/5417

A copy of the current plan holder's list can be viewed at:
http://apps.asdk12.org/depts/purchasing/meeting/Plan_Holders/2026/602.xlsx

SUBMISSION OF PROPOSALS: Proposals must be submitted to the Anchorage School District Purchasing Department, 4919 Van Buren Street, Anchorage, Alaska 99517-3137 prior to the time specified above. Proposals received after that time will not be considered and will be returned. FAXED or ELECTRONIC proposals are not acceptable. Proposals must be submitted in a SEALED package with the outside of the package clearly marked with Offeror's name, address, and phone number, and as follows:

REQUEST FOR PROPOSALS RFP 2026-602
PROFESSIONAL SERVICES CP&C AND M&O TIER 2/3 SEISMIC EVALUATION
DUE: Prior to 10:00 a.m., Local Time
DATE: August 6, 2025

ON-SITE VISIT: **An on-site visit will be held at 2:00 p.m., Local Time, July 22, 2025,** at the Facilities Support Center (CP&C and M&O Departments), 1301 Labar St., Anchorage, AK 99515. Prospective proposers are encouraged to meet the ASD Project Manager inside main entrance and walk through the proposed area of design for this RFP.

PRE-PROPOSAL CONFERENCE: **A pre-proposal conference will be held at 10:00 a.m., Local Time, July 23, 2025,** in the conference room of the Anchorage School District Purchasing Department, 4919 Van Buren Street, Anchorage, Alaska to discuss any matter concerned with this RFP. Prospective Offerors who wish to participate by teleconference may participate by calling (907) 742-6750. The line will be available approximately 5 minutes' prior the conference start time.

The Anchorage School District is committed to providing reasonable accommodations, according to applicable state and federal laws, to all individuals with a qualifying disability. If you require a reasonable accommodation in order to participate in this or any other district process, please contact the Anchorage School District's Compliance/Equal Employment Opportunity Office (907) 742-4132.

Estimated amount of proposed contract: $40,000 to $60,000

END OF COVER PAGE

A. GENERAL REQUIREMENTS

This solicitation is a REQUEST FOR PROPOSALS ("RFP") governed by applicable Anchorage School Board Policies, including Section 3311 of such Policies. Anchorage School Board Policies are available at
https://www.boardpolicyonline.com/?b=anchorage

Offerors should read this RFP carefully and review all instructions contained herein. Incomplete or incorrect proposals may be rejected as not conforming to the essential requirements of the RFP. Proposals submitted on other than the prescribed forms contained in this RFP will be rejected. Offerors may copy the forms contained in the RFP for use in their proposals, but substitute forms or formats are unacceptable. Electronic copies of the forms which Offerors must submit as part of any proposal, if any—if not provided with this RFP—may be obtained by contacting the Anchorage School District Purchasing Department. Forms shall not be altered except to supply requested offeror information.

B. INTENT OF SPECIFICATIONS

The Anchorage School District desires to enter into a contract with an offeror whose primary business is to provide professional Structural Engineering services and to complete the contract in accordance with all of its terms and conditions and in compliance with all applicable laws. The scope of work is considered performance oriented and it is the intent of the District to rely on the experience and expertise of the offeror to fully appraise itself of the work required to fulfill the terms of the contract resulting from the RFP.

C. EXAMINATION OF CONTRACT DOCUMENTS

Offerors should read this Request for Proposals carefully and review all instructions contained herein. The submission of a proposal shall constitute acknowledgement that the offeror has thoroughly examined and is familiar with the solicitation documents.

D. CONDITIONS OF THE WORK

Each offeror must acquaint itself thoroughly as to the character and nature of the services to be provided to fulfill the requirements of the resulting contract. Each offeror must complete a careful examination of the existing systems, infrastructure, geographical features, and prevailing weather conditions, as applicable, and must inform itself fully as to the difficulties to be encountered in the performance of the work, the availability of a qualified work force and other conditions related to providing the required services. No claim of ignorance of conditions that exist or hereafter may exist, or difficulties that may be encountered in the execution of the work, as a result of failures to make necessary investigations and examinations, will be accepted as an excuse for any failure or omission on the part of a successful offeror(s) to fulfill all of the requirements of the contract documents and to complete the work for the consideration set forth therein, or as the basis for any claim whatsoever.

E. QUESTIONS; METHOD FOR CLARIFICATION

Any offeror in doubt as to the true meaning of any part of this RFP may submit to the District a written request for an interpretation thereof. Questions must be received by the District's Purchasing Department at least seven (7) days prior to the date set for the submission of proposals. If such date falls on a weekend or holiday, the deadline shall be the last business day before the weekend or holiday. Questions can be delivered as follows:

Fax: Anchorage School District Purchasing Department @ 907-243-6293
Attn: Shannon Powers, Sr. Purchasing Agent

Reference: RFP 2026-602 PROFESSIONAL SERVICES CP&C AND M&O TIER 2/3 SEISMIC EVALUATION

E-mail: purchasing@asdk12.org PREFERRED METHOD
Attn: Shannon Powers, Sr. Purchasing Agent
Reference: RFP 2026-602 PROFESSIONAL SERVICES CP&C AND M&O TIER 2/3 SEISMIC EVALUATION

Mail: Anchorage School District Purchasing Department
Attn: Shannon Powers, Sr. Purchasing Agent
4919 Van Buren Street
Anchorage Alaska 99517-3137
Reference: RFP 2026-602 PROFESSIONAL SERVICES CP&C AND M&O TIER 2/3 SEISMIC EVALUATION

Two types of questions generally arise. One may be answered by directing the offeror to a specific section of the RFP. These questions may be answered by direct communication to the offeror submitting the question. Questions which in the opinion of the Purchasing Senior Director require a more detailed or complex reply, or require an answer that may affect responses to this RFP or may be prejudicial to other prospective Offerors, will be answered by issuing an addendum to all RFP holders prior to the submittal opening.

F. ERRORS AND AMBIGUITIES

1. Offeror comments concerning discrepancies, defects, ambiguities or other errors in the RFP must be made in writing and received by the District's Purchasing Department at least seven (7) days prior to the date set for the submission of proposals. If such date falls on a weekend or holiday, the deadline shall be the last business day before the weekend or holiday. Comments can be delivered as set forth in Section E, above. Any clarifications, changes or corrections to the RFP will be made only by written notice or addendum issued by the District.

2. If an offeror fails to notify the District of a discrepancy, defect, ambiguity or other error in the RFP, the offeror's proposal shall be submitted at the offeror's own risk and if a contract is awarded as a result of such proposal, the offeror shall not be entitled to additional compensation or other consideration by reason of the discrepancy, defect, ambiguity or other error, or its later correction or clarification. Protests based on any error or omission, or on the content of the solicitation, will be disallowed if the fault has not been brought to the attention of the District, in writing, at least five (5) days prior to the date set for submission of proposals. If such date falls on a weekend or holiday, the deadline shall be the last business day before the weekend or holiday.

G. ADDENDA

Addenda may be issued when changes, clarifications, or amendments to this RFP are deemed necessary by the District for any reason. If an addendum is issued, the District will make reasonable efforts to ensure that each prospective offeror receives the addendum in a timely fashion. However, the risk of non-receipt of any addendum lies solely with prospective Offerors. Offerors should contact the District at the addresses set forth in Section E, above, to ascertain if any addenda have been issued. Offerors must acknowledge receipt of each addendum issued in the space provided on the appropriate addendum form and submit such signed addendum with the proposal. No oral change or interpretation of this RFP shall be relied upon by prospective Offerors or shall be binding on the District whether issued at a pre-proposal conference or otherwise.

H. SUBMISSION OF PROPOSALS

1. All proposals, addenda, and forms must be manually signed. One (1) original and three (3) copies of the proposal, for a total of four (4).

2. Proposals delivered by telefax, facsimile or by electronic means are not acceptable and will not be considered.

3. Signed and sealed Proposals must be at the District Purchasing Department on or before the time and date stated on the face page of this RFP. Offerors are solely responsible for ensuring that the offeror's proposal package is received by the District's Purchasing Department by the deadline.

4. Late proposals will not be considered and will be returned to the offeror unopened.

5. Photographs may be included with a proposal as appropriate or as desired by the offeror. Photographs will not be returned to an offeror.

6. Offerors may submit only one proposal for evaluation.

7. No responsibility will attach to any officer or agent of the District for the premature opening of, or the failure to open, a proposal not properly addressed and identified.

I. ALASKA BUSINESS LICENSE

Offerors must hold a valid Alaska business license and any necessary applicable professional licenses required by Alaska Statute as a condition of award. Offerors should contact the State of Alaska, Department of Commerce, Community and Economic Development, Division of Occupational Licensing, for information regarding business licensing. Contact information, information regarding business licensing, and business licenses, are available at https://www.commerce.alaska.gov/web/cbpl/Home.aspx.

J. FIRM OFFER

Offers made in response to this RFP must be good and firm for a period of ninety (90) calendar days from the date specified for submittal of proposals.

K. WITHDRAWAL OF PROPOSALS

Proposals may be withdrawn on written request delivered to the District Purchasing Director (fax is acceptable) prior to the time specified for submittal. Proposals not withdrawn prior to the specified time may not be withdrawn for a period of ninety (90) calendar days after the time for receipt of proposals.

L. DISTRICT NOT RESPONSIBLE FOR PREPARATION COSTS

Each offeror understands and agrees that it submits its proposal at its own risk and expense and releases the District from any claim for damages or other liability arising out of the Request for Proposals and award process, including but not limited to: proposal preparation costs and costs associated with any challenge (administrative, judicial or otherwise (including attorney fees)) to the determination of the highest ranked proposal and/or award of contract and/or rejection of proposals, except as follows: in the event that a contract is awarded to one offeror, and it is determined after award of the contract that it should have been awarded to some other offeror, the only financial liability of the District, if any, to the aggrieved offeror shall be actual costs reasonably incurred by that offeror in the preparation and submittal of its proposal. No other obligation of any sort is created nor may liability, financial or otherwise, be asserted against the District, its Board, Board members, employees, agents or insurers to offer to award or award a contract. By submitting a proposal, each offeror agrees to be bound in this respect.

M. REJECTION OF PROPOSALS

1. Offerors must comply with all of the terms of this RFP, and all applicable local, state, and federal laws, codes and regulations. The District may reject any proposal that does not comply with all of the material and substantial terms, conditions, and performance requirements of this RFP and any proposal which contains information or material which cannot be verified or otherwise confirmed for purposes of determining responsiveness to the solicitation.

2. The District reserves the right to waive informalities and minor irregularities, and/or reject any and all proposals, and to not award the proposed contract, if in its best interest. “Informalities and minor irregularities” means matters of form rather than substance which are evident from the submittal, or are insignificant matters that have a negligible effect on price, quantity, quality, delivery, or contractual conditions and that can be waived or corrected without prejudice to other Offerors. These include items that:

    - Do not affect responsiveness;
    - Are merely a matter of form or format;
    - Do not change the relative standing or otherwise prejudice other offers;
    - Do not change the meaning or scope of the RFP;
    - Are trivial, negligible, or immaterial in nature;
    - Do not reflect a material change in the work, or;
    - Do not constitute a substantial reservation against a requirement or provision of the RFP.

N. SELECTION FOR AWARD

1. Selection for award will be accomplished in accordance with Anchorage School Board Policy Section 3311 and the terms and conditions of this solicitation. A recommendation for award, based upon the evaluation criteria specified in this RFP, will be made to the Anchorage School Board for approval, unless approval is not required under Board Policy Section 3311.

2. The District may award a contract on the basis of initial proposals received, without discussions. Therefore, each proposal should contain the offeror's best efforts from a technical standpoint.

3. For those awards requiring Board approval, the District’s Purchasing Department will make public in the Purchasing Department each Notice of Intent to Award ten (10) calendar days prior to the scheduled date for award by the Board. Offerors may, upon request to the Purchasing Department, review the proposal scoring summary prior to the scheduled Board award date.

4. Any contract awarded as a result of this solicitation will incorporate the contents of this RFP and the successful offeror's proposal, subject to the reservations set forth herein for provisions of a proposal that do not comply with material and substantial terms, conditions, and requirements of this RFP or that impermissibly restrict the rights of the District. The successful offeror(s) will be required to execute a written contract in the form included as part of this RFP and comply with its terms.

O. NEGOTIATIONS

After final evaluation, the District may negotiate with the offeror of the highest-ranking proposal. Negotiations, if held, shall be within the scope of the RFP and limited to those items which would not have an effect on the ranking of proposals. The District reserves the right to change terms and conditions during contract negotiations. If the highest-ranked offeror fails to provide necessary information for negotiations in a timely manner or fails to negotiate in good faith, or if the offeror

and the District, after a good faith effort, cannot come to terms, the District may terminate negotiations and commence negotiations with the offeror of the next highest-ranking proposal.

P. RESPONSIBLE OFFERORS

1. A contract will be awarded only to prospective Offerors who are determined to be responsible.

2. In order to determine responsibility of a prospective offeror, the District may require Offerors to supply additional information or documentation and may perform on-site pre-award surveys. Failure of an offeror to promptly cooperate or supply information in connection with a District inquiry with respect to responsibility may result in a determination of non-responsibility with respect to the offeror.

3. To be determined responsible, a prospective offeror must:

    a. Have adequate financial resources to perform the contract or the ability to obtain them;

    b. Be able to comply with the contract performance schedule taking into consideration all existing other business commitments;

    c. Have a satisfactory performance record;

    d. Have a satisfactory record of integrity and business ethics;

    e. Have the necessary organization personnel, experience, accounting and operational controls, and technical skills, or the ability to obtain them;

    f. Have the necessary equipment and facilities or the ability to obtain them; and

    g. Be otherwise qualified and eligible to receive an award under applicable laws and regulations.

Q. AWARD OF CONTRACT

1. Award of Contract

    a. Selection of the successful offeror will be by a notice in writing signed by a duly authorized representative of the District and no other act of the District or its representative will constitute an acceptance of a proposal.

2. Execution of Contract

    a. The offeror whose proposal is accepted by the District shall execute the contract and furnish the required insurance within five (5) days after presentation of the contract for signature. Failure or neglect to provide the required insurance or to execute the contract within the time specified, or within such additional time as the District, in its sole discretion, may allow, shall constitute a breach of the agreement affecting the award. The damages to the District for such breach shall include loss due to delay and interference with the District's general operations improvements program, and increased administrative expense, and other items whose accurate amount would be difficult or impossible to compute.

    b. Upon receipt of the above-referenced contract executed by the offeror, and all required insurance certificates, the properly authorized District representatives will execute the contract. The Contract shall not be effective until it is executed by a properly authorized representative of the District.

R. AGGRIEVED OFFERORS

1. Protest

   a. An interested party may protest a solicitation or a proposed award of a contract.

      i. A protest as to the specifications and/or terms and conditions of a solicitation must be received by the Purchasing Senior Director at least five (5) calendar days prior to the due date of the bid or proposal; failure to protest as provided herein constitutes a waiver of any objection to the solicitation.

      ii. For construction projects and architectural/engineering design services, the protest of a proposed award of a contract must be received by the Purchasing Senior Director within ten (10) calendar days after issuance of the Notice of Intent to Award.

      iii. For goods or services, the protest of a proposed award of a contract must be received by the Purchasing Senior Director within seven (7) calendar days after issuance of the Notice of Intent to Award, except that for purchases under $100,000, the protest must be received within three (3) business days.

      iv. The protest must include the name of the person submitting the protest, the name of the bidder/proposer represented by that person, the specific action or bid/request for proposal contract award which is being protested, a detailed explanation of the reasons for the protest, and the relief requested.

      v. The aggrieved person must serve all other interested parties with its protest.

   b. The Purchasing Senior Director shall stay the intended award of a contract unless the Purchasing Senior Director determines the award of the contract without further delay is necessary to protect the District's best interest.

   c. The Purchasing Senior Director may, in his/her sole discretion, hold a hearing.

   d. The rights and remedies granted by this section are not available for informal small purchases with an actual or potential value of less than twenty-five thousand dollars ($25,000).

   e. Failure to protest as provided herein constitutes a waiver of any objection to the solicitation and contract award.

2. Appeal

   a. A decision by the Purchasing Senior Director may be appealed to the Anchorage School Board.

   b. Any appeal shall be filed with the Superintendent within five (5) days after the decision is received by the protester and must include the name of the person submitting the appeal, the name of the bidder/proposer represented by that person, and a detailed explanation of the basis for the appeal.

   c. The aggrieved bidder/proposer must serve all other interested parties with its appeal.

   d. The Superintendent may obtain an independent review of the appeal issues if the Superintendent determines such review will assist consideration of the appeal.

e. The independent review shall not be conducted by a District employee, but must be conducted by an experienced but disinterested third party from outside the District.

f. Failure to appeal to the Anchorage School Board as provided herein constitutes a waiver of any objections to the solicitation and the contract award.

3. Consideration of Appeal

a. The decision being appealed and the findings from the independent review, if any will be reported to the Board.

b. Upon consideration of the appeal and allowing interested parties an opportunity to address the issues on appeal, the Board may:

i. Award the contract as recommended, if applicable, indicating its reasons for rejecting the appeal;

ii. Grant the appeal, indicating its reasons for granting the appeal, and determine an appropriate remedy consistent with AR3311.1(c).1 of Board Policy. The Board may award the contract at that meeting to some other bidder/proposer if it finds that a delay in making the award would adversely affect the District.

iii. Stay any award of the contract to permit further consideration of the appeal, with action to be scheduled as soon as practicable, but in no event more than twenty (20) days after the stay as initiated.

iv. Reject all bids/proposals

v. Take such other action as appears appropriate and in the best interest of the District under the circumstances.

4. Frivolous Protests

a. Signature on Protest Constitutes Certificate

i. The signature of an attorney or party on a request for review, protest, motion, or other document constitutes a certificate by the signer that the signer has read the document, to the best of his/her knowledge, information, and belief formed after reasonable inquiry it is well grounded in fact and is warranted by existing law or a good faith argument for the extension, modification, or reversal of existing law, and that it is not interposed for an improper purpose, such as to harass, limit competition, or to cause unnecessary delay or needless increase in the cost of the procurement or of the litigation.

b. Sanctions for Violation

i. If a request for review, protest, pleading, motion, or other document is filed with the Purchasing Senior Director is signed in violation of Board Policy AR3311.1(c).1, the School Board may impose upon the person who signed it, a represented party, or both, an appropriate sanction, that may include an order to pay to the other party or parties the amount of the reasonable expenses incurred because of the filing of the protest, pleading, motion, or other paper, including a reasonable attorney's fee.

S. PUBLIC RECORDS/CONFIDENTIALITY

1. This RFP and the resulting proposals received, together with copies of all documents pertaining to the award of a contract, will be kept by the District's Purchasing Office and made a part of the record which will be open to public inspection after contract award. Proposers, upon request to the Purchasing Officer, may review the proposal scoring summary after issuance of the notice of intent to award has been issued, except to the extent permissibly restricted by the offeror.

2. Offerors are advised to consult School Board Policy Section 1340 and the Alaska Public Records Act, A.S. 40.25.100-40.25.295 to verify if any of their proposal information may qualify for exemption from public disclosure. Exemptions to public disclosure requirements are narrowly construed. As such, the District cannot exempt materials that are not of a truly proprietary nature under applicable law and policy, and cannot be held liable for the disclosure of such information, even if marked for restriction by an offeror.

3. If a proposal contains any information that an offeror reasonably believes is proprietary or confidential, and is subject to protection under applicable law, each such page of the proposal must be marked "Confidential" by the offeror and the offeror must explain the basis for its determination that the information is not subject to disclosure under applicable public records laws. Cost or price information may not be restricted and will be open to public inspection. Marking an entire proposal "confidential" is not acceptable and may result in disclosure of the entire proposal.

4. By submitting a proposal, the offeror agrees to release the District from any liability resulting from the District's disclosure of information not clearly marked "Confidential." The offeror also agrees to defend any action seeking release of information marked "Confidential" and to indemnify and hold the District, its Board, employees and agents, harmless from any judgments, damages and costs awarded against the District, its Board, employees or agents, in favor of a party requesting information submitted by an offeror. Additionally, the offeror understands and agrees that if a request is made under applicable public records laws, the District will notify the offeror of such request but under no circumstance shall the District be required to commence or defend any action to prevent the disclosure of any information submitted by an offeror, including information the offeror believes to be confidential or proprietary.

T. EQUAL EMPLOYMENT OPPORTUNITY

1. The Contractor certifies that it will not discriminate against any employee or applicant for employment because of race, color, religion, national origin, ancestry, age, sex, marital status, mental or physical disability, or change in marital status, in employment, provision of services or otherwise. The Contractor shall take affirmative action to ensure such non-discrimination, including but not limited to the following: employment, upgrading, demotion, transfer, recruitment or recruitment advertising, layoff or termination, rates of pay or other forms of compensation, and selection for training including apprenticeship. The Contractor shall post in conspicuous places, available to employees and applicants for employment, notices setting forth the provisions of this nondiscrimination clause.

2. The Contractor shall state, in all solicitations or advertisements for employees to work in the performance of this Agreement, that all qualified applicants will receive consideration for employment without regard to race, color, religion, national origin, ancestry, age, sex, marital status, mental or physical disability, or change in marital status.

3. The Contractor shall comply with the requirements of the Anchorage Municipal Code, Chapter 7.50.010-.120, as well as any procedures adopted by the District to implement the policies set forth therein.

4. The Contractor shall comply with any and all of the applicable laws and directives, and any

regulations which may be applicable to the Project or this Agreement.

5. The Contractor shall include the provisions of this Article in every Subcontract and purchase order, and shall require each Subcontractor to include these provisions in every sub-subcontract, so that these provisions will be binding upon each Subcontractor, sub-subcontractor and vendor providing services or goods to the Project.

6. The Contractor shall cooperate fully with the District's efforts which seek to deal with the problem of unlawful discrimination, and with all other District efforts to guarantee fair employment practices under this contract and promptly comply with all requests and directions from the Anchorage Equal Rights Commission and State Commission for Human Rights or any of its officers or agents relating to prevention of discriminatory employment practices.

U. NON-DISCRIMINATION

1. No Contractor on any District contract may illegally discriminate on the basis of sex, race, color, religion, gender identity, sexual orientation, national origin, ancestry, age, marital status, changes in marital status, pregnancy, parenthood, physical or mental disability, Vietnam era veteran status, genetic information, or good faith reporting to the board on a matter of public concern in employment, provision of services, or otherwise.

2. Any Contractor submitting a bid or proposal of one hundred thousand ($100,000) or more must certify that if awarded a contract on the basis of that bid or proposal, he/she as the contractor will not illegally discriminate against any member or applicant for employment because of sex, race, color, religion, gender identity, sexual orientation, national origin, ancestry, age, marital status, changes in marital status, pregnancy, parenthood, physical or mental disability, Vietnam era veteran status, genetic information, or good faith reporting to the board on a matter of public concern in employment, provision of services, or otherwise.

V. NOTICE OF COMPLIANCE

1. All successful Contractors shall ensure such non-discrimination.

2. All successful Contractors must agree to post in conspicuous places, available to employees and applicants for employment, notice setting forth the provisions of this non-discrimination section and this section shall be deemed to be a part of every contract entered into by the District under these policies.

W. CONFLICT OF INTEREST

1. The Contractor agrees to certify that Anchorage School District employees, School Board members, or a member of their household are not in conflict of interest with the contract and Board Policy as follows (AR3311.1(e).1 Disclosure and Waiver of Conflict of Interest):

   a. No Board member, employee, or a member of their household, shall acquire, directly or indirectly, an economic interest in a District or Municipal contract, or engage in business with the District or the municipality, unless the contract is competitively solicited and other requirements of Section 3311 of Board Policy and section 1.15 of the Anchorage Municipal Code are met.

   b. The following acts and circumstances shall not be deemed to be in conflict with the performance of official duties if, at the earliest opportunity after having acquired such knowledge, the Board member or employee files a disclosure pursuant to AR3311.1(e).1 or requests and obtains a waiver pursuant to Board Policy AR3311.1(e).2:

1. Such person owns a sole proprietorship, or is a partner in a partnership, or is an officer, director, major shareholder (five percent (5%) or more of the outstanding shares) or has management control in a corporation that submits a bid, proposal or quotation to the District or attempts to enter or enters into a contract with the District;

2. Such person has any significant (five percent (5%) or more) financial interest in any sale, lease or rental to the District of any service or property and such person has knowledge that the District intends to purchase, lease or rent the property or service;

3. Such person wishes to sell or receive royalties on books or materials sold to the District for use in the school system for which the employee is the author;

4. Such person is an employee who has been providing private services to a child who transfers to a new school or class or advances to a higher grade and the child becomes a student in the class being taught/aided by his/her provider.

2. Board Members, District employees, and their household and/or immediate family members are required to comply with Board Policies and the Municipal Ethics Code by disclosing conflicts of interest.

   a. When a board member, employee, or their household and/or immediate family member intends to do business with the District, the appropriate District and Municipal forms must be filed by the Board Member or District employee with the Municipal Clerk's Office and the Purchasing Department.

Note: *Notice of Intent To Respond To Public Solicitation* shall be filed with the Municipal Clerk's office in advance to allow a minimum of **7 calendar days to elapse between electronic publication by the clerk and the final date** for submitting a response to the solicitation. The form may be obtained from the Municipality of Anchorage website, www.muni.org. District *Disclosure* and *Request for Waiver* forms and instructions may be obtained from the Conflict of Interest link on the Procurement Department page of the ASD website, www.asdk12.org.

   b. The responsibility for complete and timely filing rests solely with the Board Member or District employee.

X. SEX OFFENDER/CHILD KIDNAPPER REGISTRY

Anchorage School Board Policy 3515.5 prohibits a contractor whose employees or agents may have direct or incidental contact with District students from sending any employee or agent to district property who has been convicted of a sex offense under federal law or the law of any state and who is required to register as a sex offender under Alaska law or by court order, or who has been convicted of child kidnapping under federal law or the law of any state and who is required under Alaska law or court order to register on the Alaska Department of Public Safety Sex Offender/Child Kidnapper Central Registry. Board Policy 3515.5 requires contractors to certify in writing the contractor's knowledge of and compliance with Board Policy 3515.5. ***Prior to executing a contract*** for this project, the selected Contractor shall verify that no employee or agent who will be on district property is registered as a sex offender or child kidnapper in Alaska [Alaska Department of Public Safety "Sex Offender/Child Kidnapper Registry"] or in any other state. In addition, the contractor shall certify that, to its knowledge, no employee or agent is a convicted sex offender or child kidnapper. Certification will be required at time of award.

Y. CONTACT WITH SCHOOL STAFF AND AUTHORIZED SCHOOL COMMUNITY GROUPS

Offeror is not to contact site's school staff or authorized community groups for purposes of solicitation unless otherwise authorized by the Purchasing Senior Director.

Z. CONTRACT INDUCEMENTS

No payment, gratuity or offer of employment shall be made in connection with any contract, by or on behalf of the subcontractor to the prime contractor or higher tier subcontractor or any person associated therewith, as an inducement for the award of a subcontract or order.

AA. STANDARD CONTRACT TERMS

In addition to carefully reading all of the information in the RFP, Offerors must carefully read and review the attached standard contract terms and conditions. The successful Offeror shall be required to enter into an agreement with the District which will be substantially similar to the sample.

END OF SECTION I

A. EVALUATION OF PROPOSALS

1. All proposals will be reviewed by the District's Purchasing Department to evaluate administrative responsiveness of proposals to determine if Offerors have complied with the administrative proposal requirements and to determine if proposals meet the minimum mandatory criteria set forth below.

2. Proposals meeting minimum mandatory requirements then will be evaluated by an evaluation committee comprised of District employees or other persons deemed appropriate by the District using the Evaluation Criteria specified in this RFP. Evaluation of proposals in accordance with the evaluation criteria will result in a numerical score for each proposal. Each criterion has an assigned weight for this RFP which demonstrates its relative importance. Evaluation of proposals will be accomplished as follows:

   a. Each Evaluator will individually review and score each offeror's proposal on a scale of 0 to 1 for each of the Technical Evaluation Criteria.

      A rating of "0" indicates a proposal which is non-responsive and/or provides no quality or value to the District and a rating of "1.0" indicates a proposal which is completely responsive and/or provides significant quality and value to the District. Ratings within the range indicate the level at which the proposal is responsive and/or provides quality and value to the District.

   b. After completion of ratings by each Evaluator, the Selection Committee may discuss the proposal. Evaluators may then alter their ratings; however, any changes shall be based only on the proposal and the Evaluation Criteria.

   c. The chairperson will obtain the ratings for the Evaluation Criteria, which ratings will then be multiplied against the points available for each criterion. The sum of the weighted scores for each proposal will result in a total weighted score from each member of the evaluation committee. The total weighted scores of all Evaluators will be summed to determine the total weighted score for each proposal. The maximum score obtainable for any proposal is equal to the product of the maximum points for the evaluation criteria multiplied by the number of Evaluators.

   d. Based upon the results of the proposal scoring, the District may, in its discretion, conduct discussions with Offerors whose proposals are determined to be reasonably susceptible to award. Such discussions, visits and presentations are for the purpose of ensuring full understanding of the requirements of the RFP and offeror proposals and may not result in any material or substantive change to proposals. Offerors selected by the Selection Committee for interviews may be permitted to submit final written, graphic and verbal presentation information for consideration by the Selection Committee in response to the above purposes. Only those members of the offeror's staff who will be in responsible charge and/or will carry out the actual tasks should participate in the interviews.

   e. Subsequent to the interviews, the Selection Committee will make a final rating based upon the original criterion supplemented by interview information for the purposes of determining the highest ranked proposer. The Selection Committee shall use the same procedure as specified for the initial proposal rankings. The final ranking may or may not be the same as the order of ranking after completion of the initial ranking.

   f. For purposes of this RFP, proposals that are "reasonably susceptible to award" means the three (3) highest scoring proposals, unless, in the sole discretion of the District's Purchasing Senior Director, one or more of the three highest scoring proposals did not achieve a score high enough to be within the competitive range and to remain under consideration for award when ranked with other proposals or the District received one or

more additional proposals that are within the competitive range of the three highest scoring proposals such that the additional proposal(s) may remain under consideration when ranked with the other proposals. This is not a strict mathematical formula and may not be challenged on that basis except in the case of obvious arithmetic errors.

3. The District reserves the right, at any time, to determine that a proposal is non-responsive and to request additional information to determine responsiveness.

4. All Offerors will be advised of the offeror selected for negotiation with a Notice of Intent to Negotiate. If contract negotiations are unsuccessful with offeror selected for negotiation, the School District may either cancel the solicitation or negotiate with other Offerors in the order of ranking.

B. EVALUATION CRITERIA

Proposals will be scored using the criteria listed below to determine which proposal best meets the needs of the Anchorage School District. The criteria to be considered during the evaluation and their associated weights are as follows:

Item	Criteria	Points
1.	**PROJECT APPROACH**	25
2.	**METHODS**	25
3.	**MANAGEMENT**	10
4.	**FIRM'S EXPERIENCE**	15
5.	**PROPOSED PROJECT STAFF**	15
6.	**WORKLOAD AND RESOURCES**	10
	TOTAL POINTS POSSIBLE	**100**

END OF SECTION II

Each response must be identified and keyed to the applicable criterion and assembled in the order in which the criteria are listed in Section II, Part B, so the criterion to which information applies shall be plainly evident. Material not so identified or assembled may be discarded without evaluation. Each proposal shall be submitted on standard 8 1/2" x 11" bond paper bound on one side. Proposals should be prepared simply and economically, providing a straightforward, concise delineation of the capabilities proposed to satisfy the requirements of this RFP. In addition, small print or typeface that is difficult to read may affect scoring.

To achieve a uniform review process and obtain the maximum degree of comparability, it is required that the proposals be organized in the manner specified below. Proposals shall not exceed twenty (20) pages in length (excluding letter of transmittal, resumes (resumes shall not exceed two (2) pages in length), table of contents, attachments, or dividers. Information in excess of those allowed will not be evaluated or scored. One page shall be interpreted as one side of single lined, typed, 8 1/2" X 11", piece of paper.

To ensure that proposals are evaluated fairly and that comparisons between proposals are accurate, Offerors must submit proposals in the format outlined below. Failure to comply with these requirements may cause a proposal to be rejected as non-responsive and eliminated from further consideration.

A. PROPOSAL TRANSMITTAL FORM

Submit the completed Proposal Transmittal Form (Attachment A) as the first page of the proposal. The Proposal Transmittal Form must be signed by an authorized representative of the offeror.

B. PROPOSAL NARRATIVE

1. PROJECT APPROACH — Weight: 25

   Restate the proposed Scope of Services, outlining the objectives and scope as perceived. Do not repeat the statement of services provided herewith, but elaborate on the tasks, conditions, deliverables or other specifics deemed significant and necessary to demonstrate a complete understanding of the technical and substantive issues to be addressed. Define any assumptions made in formulating response. If scope includes design services for a construction project, express any opinions regarding alternative design considerations that could impact construction costs.

2. METHODS — Weight: 25

   Response must outline the methods for accomplishing the proposed contract. Consider what, when, where, how, and in what sequence the work will be done. Include proposed timeline with milestones. Identify the amount and type of work to be performed by any sub-consultants. Consider how each task may be carried out; what services or interaction may be required from/with the Contracting Agency. Suggest alternatives, if appropriate. Identify any distinct and substantive qualifications for undertaking the proposed contract, such as the availability of specialized equipment or unique approaches or concepts relevant to the required services, which the firms may use.

3. MANAGEMENT — Weight: 10

   Response must describe the administrative and operational structures that will be used for performing the proposed contract. Address who will have overall responsibility for the contract and who will have direct responsibility for specific disciplines. Discuss the lines of authority. Use of a table or chart is preferred in your response. When applicable, include discussion of public participation process and coordination with State and Municipal agencies.

4. FIRM'S EXPERIENCE — Weight: 15

   Discuss the offeror's background and qualifications to establish experience and performance as a team leader for professional services similar to those required by this project. Discuss the relevance of past projects (program, unique features, schedules, budgets, etc.) to this project. List at least three (3) references (contact persons and telephone numbers) for the firm.

5. PROPOSED PROJECT STAFF Weight: 15

Response must name proposed leader(s) for the following categories plus any other essential personnel who will be directly and routinely engaged in performing the work:

1 – Principal-in-Charge	3 – Project Manager
2 – Contract Manager	4 – Project Engineer

Describe the work to be performed by the named Leader(s), and their qualifications in terms of educational and substantive experience directly related to the proposed services**.** Identify: employer, professional discipline and/or job classification, Alaskan registration number, and state of residency. A response prepared specifically for this proposal is required. Marketing resumes often include irrelevant information, which may detract from the evaluation of proposal. Lists of projects without relevant details are not useful. Focus on individuals' specific duties and responsibilities and how project experience is relevant to the proposed services.

6. WORKLOAD AND RESOURCES Weight: 10

Response must: (1) discuss both current and potential time commitments to all clients (i.e. not only the District) for the proposed Project Staff; and (2) demonstrate adequate support personnel, facilities and other resources to provide the services required throughout the project's term. Briefly address capabilities for providing additional services and/or services under an accelerated schedule. Address capacity to reassign personnel, equipment and facilities whenever the proposed contract would not require such capabilities or would be delayed.

END OF SECTION III

A. SCOPE OF WORK

1. The requirements of this project shall consist of providing complete design services necessary to provide a Tier 2/3 Seismic Evaluation at the Facilities Support Center (Capital Planning & Construction and Maintenance & Operations Departments).

   This qualifications-based selection focuses on the Prime Consultant as the responsible and contractual leader of a team. The Offeror will only identify required disciplines in the proposal. Once selected and given a Notice of Intent to Negotiate by the School District, the Prime Consultant Offeror will proceed with a qualifications-based selection of Sub-consultants. The School District will consult with the Offeror, reviewing and commenting on proposed Sub-consultants as appropriate. The School District reserves the right to object to selection of Sub-consultants based on considerations of cost, performance, special qualifications, and/or known work load relative to resources.

   The Prime Consultant is the project design coordinator and document quality control authority. Prime Consultant will review and verify deliverables prior to submission to Owner. Incomplete or lacking deliverables may be rejected. Owner will review complete deliverables for compliance and acceptance.

2. Planned Project Scope of Work:

   a. The evaluation will follow the Anchorage School District Seismic Evaluation and Retrofit Guide and ASCE 41-23.
      1. Attachment C is the current version of the Anchorage School District Seismic Evaluation and Retrofit Guide (Based off ASCE 41-17). The document is currently being updated. The final version will be available to the successful proposer.

   b. Review the attached Tier 1 evaluation.

   c. Investigate the areas of potential weaknesses identified in the Tier 1 report.

   d. Recommend retrofits that will increase the seismic resiliency of the building including ROM estimate.

   e. Complete FEMA Benefit Cost Analysis (BCA) on recommended seismic retrofits.

B. SCOPE OF CONSULTANT SERVICES

For the purpose of this document, the phrase “Consultant(s)” refers to the person, partnership, corporation, joint venture, or other business entity with which the District contracts to provide the professional services required for this project.

Anticipated Scope of Consultant Services: For this project, the Consultant shall provide all professional services necessary to support the successful completion of this project. The Consultant’s services shall include, but are not limited, to the following:

1. Consultant Design Phases/Deliverable Requirements: The following design phases with corresponding design deliverables shall be required for this project.

   a. Draft Report

   b. Final Report

2. <u>Phase 1</u> Evaluation Development

a. Develop Report

i. Verification of the Planned Project Scope of Work: the Consultant shall verify and update the Planned Project Scope of Work. The Consultant shall consult with the District Project Manager for any deviation from the Planned Project Scope of Work prior to completing the Draft Report. The Draft Report shall reflect the final approved evaluation scope of work.

ii. Verification of the Construction Budget: The Consultant shall verify the recommended seismic retrofit projects with respect to required cost estimates.

iii. Project Report Review: ASD Reviews are organized by the ASD PM and executed using Bluebeam Revu (Bluebeam) sessions at the draft report phase. The use of Bluebeam allows for a collaborative, digital review for the Project; involving ASD Reviewers and Consultants, including the Consultant's cost estimator. ASD will provide all comments, written and noted, in the Bluebeam session and the Consultant shall assist the District by reviewing and responding in writing to all comments in the Bluebeam session; identifying and making written recommendations to the ASD Project Manager regarding the most critical design issues. The most critical path design issues will be summarized and discussed in a Post-Review Debrief. The Project Manager will organize/invite Reviewers to the Post-Review Debrief. The Consultant shall act as the Meeting Facilitator of the Post-Review Debrief. The Post-Review Debrief is not meant to be a 'page-turn' review of documents and comments, but a one-hour summarization of the most critical path items and the team's intent/approach to resolve. Once the Post-Review Debrief is held, the PM will give Consultant notice to proceed to the final report, pending any requested changes prior to NTP. The Project Manager will then verify that each comment and response has a Bluebeam ***status*** set and ***finish*** the Bluebeam session for ASD archives.

iv. Bidding and Permitting: The Consultant shall assist the District during the bidding and permit review of the project. During this phase of work, the Consultant's services shall include providing assistance during Municipality of Anchorage plan review and construction permit application process [utilizing MOA electronic plans review protocols], attendance at pre-bid conference and pre-bid site visits, answering bidder's questions, and assisting the District in preparing necessary bid addendum. Provide all signed and stamped bid documents electronically on writable CD-ROM (drawings should be submitted in most current version of AutoCAD used by the Anchorage School District or as determined by ASD Project Manager and PDF versions).

3. Anticipated Required Consultant Service Disciplines: Anticipated disciplines required for this project shall include, but are not limited to:

a. Structural Engineering

b. Cost Estimating

4. Additional Requirements:

a. Reference Record Drawings: The Consultant shall research the District Plans Room records to identify important record drawings that may be issued with the Bid Documents as Reference Record Drawings or made available for viewing by the bidders at the District Plans Room. The Reference Record Drawings are intended to provide sufficient information to allow bidders to ascertain the physical conditions of the building including types of construction, building dimensions, etc. The Consultant shall prepare a Reference Record Drawing Cover Memo describing the reference record drawings. The cover memo

shall include historical building and project information. If applicable, the Reference Record Drawing Cover Memo and the Reference Record Drawings shall be issued as part of the Bid Documents.

b. Extended District Review: The Consultant shall acknowledge that while review periods are scheduled during the design process, the District plan review resources may not be able to accommodate the schedule due to work load. In some cases, follow-up comments beyond the scheduled review period may be necessary. The Consultant is encouraged to be proactive in assisting the District in facilitating the design review process.

c. Use of Standard Anchorage School District Invoice Format: The Consultant shall utilize a standardized Anchorage School District Invoice Format. The format will be provided by the District to the consultants.

C. PROJECT SCHEDULE

Based on the Tentative Project Schedule and Specific Project Schedule Requirements below, the Offeror shall develop a preliminary project schedule covering the period from Notice to Proceed (NTP) through Design Completion based on anticipated workload and resources and include it as part of the Offeror's proposal response to Part B, Article 2 Methods. Identify all submittal milestones including submittal dates, cost estimate submittal dates and District review comments periods.

1. Tentative Project Schedule for Design Work:

Requirement		**Anticipated Dates**
RFP/Consultant Selection/Negotiation:		August 2025
Anticipated Contract Award/NTP:		September 2025
Draft Report:		February 2026
Final Report, Estimates and BCA:		July 2026

2. Specific Project Schedule Requirements:

   a. Allow 2 weeks after each submittal for review by the District.

D. INFORMATION TO BE PROVIDED BY THE DISTRICT

The following information is available for review and use by the consultants during design:

1. Facilities Support Center (CP&C and M&O Departments)
   1301 Labar St.
   Anchorage, AK 99515

2. Historical As-Built/Project Documents/AHERA Documents – Existing documents are available at the District Capital Planning & Construction Department. Proposers can view existing documents by coordination with the planning & design section for access to the plans room. Proposer must coordinate a time in advance with Capital Planning & Construction (CP&C) planning & design staff at 907-348-5264.

E. ADDITIONAL INFORMATION

1. Attachment C – Seismic Evaluation and Retrofit Guide for Existing Anchorage School District Buildings – document is being updated. Final version will be available to the successful proposer.

2. Attachment D – Capital Planning and Construction (CP&C) ASCE 41 – Tier 1 Evaluation

3. Attachment E – Floor Plan

END OF SECTION IV

THIS FORM MUST BE RETURNED WITH THE OFFEROR'S PROPOSAL

Addendum Number(s)/Date(s)_____ is/are hereby acknowledged.

REPRESENTATION. THE OFFEROR REPRESENTS THAT IT [ ] IS, [ ] IS NOT A MINORITY BUSINESS ENTERPRISE;
AND/OR
REPRESENTATION. THE OFFEROR REPRESENTS THAT IT [ ] IS, [ ] IS NOT A WOMEN BUSINESS ENTERPRISE;
AND/OR
REPRESENTATION. THE OFFEROR REPRESENTS THAT IT [ ] IS, [ ] IS NOT A LABOR SURPLUS AREA FIRM.

FIRM'S NAME:_____

MAILING ADDRESS:_____

CITY/STATE/ZIP:_____

PHYSICAL BUSINESS ADDRESS:_____

CITY/STATE/ZIP:_____

CONTACT PERSON FOR THIS SOLICITATION:_____

FAX NO.:_____

TELEPHONE NO.:_____

CELL PHONE NO.:_____

ALASKA BUSINESS LICENSE NO.:_____

FEDERAL TAX ID NO.:_____

EMAIL ADDRESS: _____

CERTIFICATION

I certify that I am a duly authorized representative of the firm listed above and that the information and materials enclosed with this proposal accurately represent the capabilities of the firm to provide the services indicated in compliance with the requirements of the solicitation. I certify that no member of the School Board or District employee, or spouse or other member of his/her household, has or shall have any undisclosed interest in the firm or this proposal, as provided in the Instructions to Offerors ("Conflicts of Interest"). The School District is hereby authorized to request from any individual any pertinent information deemed necessary to verify information regarding the capacity of the firm and for purposes of determining responsiveness of the proposal or responsibility of the firm as a prospective contractor.

In compliance with the solicitation, the offeror agrees, if this offer is accepted within 90 calendar days from the date specified in the solicitation for receipt offers, to furnish any or all items on which prices are offered at the price set opposite each item, delivered at the designated places, within the times specified in the solicitation.

SIGNATURE: _____

PRINTED NAME AND TITLE: _____

DATE: _____

ANCHORAGE SCHOOL DISTRICT
PROFESSIONAL SERVICES AGREEMENT

(LESS Than $100,000)

CONTRACT/P.O. NUMBER:
DATE PREPARED:

PROJECT TITLE:
PROJECT NUMBER:
CONTRACTOR:

ASD PROJECT MANAGER: PHONE NUMBER:

ARTICLE 1 – SERVICES
(DESCRIBED BELOW OR IN REFERENCED ATTACHMENT)

1.1 Provide professional design services @

ARTICLE 2 – PERIOD OF PERFORMANCE

2.1 The Contractor shall commence the services described herein upon receipt of this fully executed Agreement and shall complete services @

ARTICLE 3 – COMPENSATION

3.1 Compensation for services shall not exceed the authorized amount(s) entered below and is in accordance with the attached proposals from @ dated @.

Following completion of services and receipt of specific approval from the Anchorage School District, the Contractor shall submit one invoice. If the period of performance is in excess of three months, the Contractor may submit interim billings monthly, which represent the percentage of completed work for fixed-price work or substantiated charges for other than fixed-price work. The Contractor shall substantiate all charges other than for fixed price or fixed profit by attaching receipts, time sheets, summary of units completed, or other proof of expenditures.

Method of Payment	**Authorized Amount(s)**	**Funding Code(s):**
Fixed Price		
Time and Materials		
Unit Prices		
Salaries		
Expenses		
Hourly Rate		
TOTALS		

ARTICLE 4 – SIGNATORIES

4.1 To this Agreement between the above-named Contractor and the Anchorage School District, effective on the last date executed by its parties, in consideration of the terms, conditions and requirements of Articles 1 through 6 herein, the parties hereto agree. (Incorporated Contractor must affix corporate seal or attach corporate resolution authorizing signatory to execute this Agreement.)

CONTRACTOR NAME	ANCHORAGE SCHOOL DISTRICT
SIGNATURE DATE	SIGNATURE DATE
TITLE: Principal	NAME: David Whiting TITLE: Senior Director, Purchasing/ Warehouse

ARTICLE 5 - INDEMNIFICATION AND INSURANCE

5.1 The A/E consultant shall obtain and maintain all insurance required under this section. The A/E consultant shall file with the Contracting Officer a Certificate of Insurance showing the type and amounts of insurance, the policy number, and the expiration date.

5.2 Certificates of Insurance shall be in the name of the Anchorage School District as an additional insured and shall provide the Contracting Officer, Anchorage School District, with at least a thirty (30) day written notice of any material change, cancellation or non-renewal of the policy(s) during the Contract Period.

5.3 Statement of Insurance. At the time of contract execution the A/E consultant must have in effect:

WORKER'S COMPENSATION	Statutory Limit	
EMPLOYER'S LIABILITY	$1,000,000	
COMMERCIAL GENERAL LIABILITY	$1,000,000 $2,000,000	Combined Single Limit Aggregate Limit
COMPREHENSIVE AUTOMOBILE	$1,000,000	per accident for any auto
PROFESSIONAL LIABILITY INSURANCE	$100,000	☐ not required if checked

ARTICLE 6 - GENERAL CONDITIONS

6.1 Termination

6.1.1 Termination - This Agreement may be terminated for just cause by either party upon ten days written notice. If warranted, the Contractor will be compensated for reasonable expenses incurred for services completed prior to the date of termination. Federal funding agency, if any, must approve any settlement in conformance with applicable federal regulations.

6.1.2 Termination - The Anchorage School District may at any time terminate (convenience termination) or suspend this Agreement for its needs or convenience upon ten (10) Days' written notice to the Contractor. In the event of a convenience termination or a suspension of the Agreement for more than three (3) months, the Anchorage School District will compensate the Contractor for services performed and any expenditures incurred prior to the effective date of the written notice of termination or suspension. No fee, profit or other compensation for the uncompleted portion of the services will be paid, except for already incurred indirect costs which the Contractor can establish and for which the Anchorage School District would have compensated the Contractor over the life of this Agreement, but because of the termination or suspension would have to be absorbed by the Contractor without further compensation.

6.2 Officials not to Benefit - The Contractor shall comply with all applicable federal and state laws and regulations regarding ethical conduct of public officials and employees.

6.3 Independent Contractor - The Contractor and their agents and employees shall act in an independent capacity and not as officers or agents of the Anchorage School District in the performance of this Agreement except that the Contractor may function as the Anchorage School District's agent as may be specifically set forth in this Agreement.

6.3.1 Any and all employees of this Contractor while engaged in the performance of any work or services required by the Contractor under this Agreement, shall not be considered employees of the Anchorage School District and any and all claims that may or might arise under the Worker's Compensation Act on behalf of said employees, while so engaged and any and all claims made by a third party as a consequence of any negligent act or omission on the part of the Contractor's employees, while so engaged on any of the services to be rendered herein, shall be the sole obligation and responsibility of the Contractor.

6.3.2 This Agreement will be declared null and void should the Anchorage School District determine that by Internal Revenue Service definitions employees of the Contractor or of any subcontractor may be an employee of the Anchorage School District.

6.4 Proselytizing - The Contractor agrees that it will not engage, on a full or part time basis, during the period of this Agreement, any person or persons who are or have been employed by the Anchorage School District during the period of this Agreement or during the 90 days immediately preceding the date of this Agreement except those who have been regularly retired or approved in writing by the Anchorage School District.

6.5 Covenant Against Contingent Fees - The Contractor shall comply with the Copeland "Anti-Kickback" Act (18 USC 874) as supplemented in federal Department of Labor Regulations (29 CFR, Part 3), which are incorporated by reference and made a part of this Agreement.

6.6 Subcontractors - The Contractor shall not engage any subcontractor(s) without the prior approval of the Anchorage School District.

6.7 No Assignment or Delegation - The Contractor may not assign or delegate this contract, or any part of it, or any right to any of the money to be paid under it, except with the written consent of the Anchorage School District.

6.8 Disputes - Any dispute concerning a question of fact arising under this Agreement which is not disposed of by mutual consent shall be decided without bias by the Anchorage School District which shall reduce the decision to writing and furnish a copy of it to the Contractor within 30 days of receipt of all necessary information from the Contractor upon which to base the decision. The Anchorage School District's decision is final and conclusive unless, within 30 days of receipt of the decision, the Contractor delivers a Notice of Appeal to the Anchorage School District. The Notice of Appeal shall include specific exceptions to the Anchorage School District's decision including specific provisions of this Agreement, which the Contractor intends to rely upon on appeal. General assertions that the Anchorage School District's decision is contrary to law or to fact are not sufficient. The Superintendent will appoint an Appeals Officer who will render a decision within 60 days of Notice of Appeal and the decision constitutes the exhaustion of contractual and administrative remedies.

6.9 Extent of Agreement/Changes - This Agreement represents the entire and integrated Agreement between the Anchorage School District and the Contractor and supersedes all prior negotiations, representations or agreements, written or oral. This Agreement may be changed only by written amendment executed by both the Anchorage School District and the Contractor.

6.10 Taxes - As a condition of performance of this Agreement, the Contractor shall pay all federal, state and local taxes incurred by the Contractor and shall require their payment by any other persons in the performance of this Agreement.

6.11 Governing Laws - This Agreement is governed by the laws of the State of Alaska and federal and local laws and ordinances applicable to the work performed. The Contractor shall be cognizant and shall at all times observe and comply with such laws which in any manner affect those engaged or employed in the performance, or which in any way affects the manner of performance, of this Agreement.

6.12 Ownership of Work Products

6.12.1 Ownership of Work Products produced under this Agreement, including items which have pre-existing copyrights, shall remain with the Contractor. The Anchorage School District shall have an unrestricted, irrevocable license to use the Work Products without infringing any copyrights, and without additional compensation to the Contractor.

6.12.2 Unrestricted use shall include use: (1) for any additions, alterations, or other subsequent work to the Project; (2) to demonstrate or reference conceptual arrangements, in whole or in part, for incorporation into any District project; and (3) reuse of a prototypical design on an Anchorage School District project.

6.12.3 Should the Anchorage School District elect to reuse Work Products produced by the Contractor and its Subcontractors under this Agreement and owned by the Contractor on any other project, the Anchorage School District shall indemnify, hold harmless and defend the Contractor and its Subcontractors against any damages or liabilities arising from such reuse.

6.12.4 When Work Products produced by the Contractor and its Subcontractors under this Agreement are reused by the Anchorage School District, the Contractor's and Subcontractors' signatures, professional seals and dates shall be removed. Such Work Products, which require professional signature and seal, will be signed, sealed and dated by the professional who is in direct supervisory control and responsible for the new project for which such Work Products are being reused.

6.12.5 The Contractor shall include this provision in every Subcontract so as to be binding on every Subcontractor.

SEISMIC EVALUATION AND RETROFIT GUIDE

For Existing Anchorage School District Buildings

Updated 03/29/2021

Anchorage School District **Seismic Evaluation and Retrofit Guide**
For Existing ASD Schools

Contents

Anchorage School District **Seismic Evaluation and Retrofit Guide**
For Existing ASD Schools

Executive Summary

The following document is to be used to assist in the seismic screening, evaluation, and retrofit of existing Anchorage School District (ASD) school buildings. It outlines four progressive methods for screening, evaluating, and retrofitting these schools, all in relation to seismic events: Rapid Visual Screening, Screening, Evaluation, and Retrofit.

Rapid Visual Screening (RVS) is a method to determine the probability of failure based on basic criteria determined about the building such as building type, year of construction, soil type, etc. The RVS section is based on Federal Emergency Management Agency (FEMA) 154. Because of the basic nature of this method, this can be conducted on an inventory of buildings for easy comparison and understanding of the relative/ranked seismic risk. Buildings are rated by Seismic Score “S”, and buildings receiving a lower score have a higher probability of failure during large earthquakes.

The Screening section (Tier 1) is based on American Society of Civil Engineers (ASCE) 41-17, Chapter 4. This section of the guide is used to identify possible structural and nonstructural deficiencies based on an ASD-determined performance objective using checklists accumulated from observed deficiencies revealed within distinct building types during previous large earthquakes. These potential deficiencies are prioritized and put into a report that includes a conceptual narrative on how these potential deficiencies could be grouped and mitigated.

The Evaluation section (Tier 2 or 3) is based on ASCE 41-17, Chapters 5 and 6. This section of the guide is used to further evaluate existing building components in more detail and to verify structural and nonstructural deficiencies identified in the Screening report, based on ASD-determined performance objectives. The verified deficiencies are prioritized and put into a report that includes a schematic narrative on how these verified deficiencies could be grouped and mitigated.

The Retrofit section (Tier 2 or 3) is also based on ASCE 41-17, Chapters 5 and 6. This section of the guide is to be used following the Screening and Evaluation phases for developing the retrofits for specific deficiencies, to a performance objective determined by ASD. The deficiencies mitigated by any retrofit project are typically voluntary and may not include the retrofit of all verified deficiencies listed in the Evaluation report, depending on ASD funding priorities and the cost of retrofit versus replacement of the entire school.

A. Definitions

The following terms are used throughout this document. In this section, no specific guidance is given, only general descriptions.

- IBC/ASCE 7
  - The International Building Code (IBC) and American Society of Civil Engineering (ASCE) 7, *Minimum Design Loads and Associated Criteria for Buildings and Other Structures* are the basic building codes to which new buildings are designed.
  - At the time of publication, this guide is based on IBC 2018 and ASCE 7-16, with local amendments as adopted by the Municipality of Anchorage (MOA).
  - Life Safety is a concept that governs all new building code provisions within IBC/ASCE 7 for Risk Category II buildings. The basic goal in any extreme event is that all persons can safely egress the building. This concept does not ensure the reparability of the building or the state of the building after the event. The only objective is that there is no loss of life.
- Risk Category
  - Buildings are categorized into four groups, generally by number of occupants, but also by community need. These are defined by the IBC and ASCE 7.
  - Risk Category I – Buildings that represent a low hazard to human life in the event of failure, such as minor storage facilities, barns, sheds, temporary facilities, etc.
  - Risk Category II – All buildings except those listed in Risk Categories I, III, and IV. An example would be a single-family home, a retail store, or an office building.
  - Risk Category III – Buildings that represent a substantial hazard to human life in the event of failure. This would include buildings where 300 people or more congregate in one area, detention facilities, and primary and secondary schools with a capacity of 250 or more.
  - Risk Category IV – Buildings designated as essential facilities, including hospitals, fire stations, police stations, or buildings designated as emergency shelters.
- IEBC
  - The International Existing Building Code (IEBC) governs existing buildings and their repair, alteration, addition, and repurposing (change of use or occupancy).
  - At the time of publication, this guide is based on IEBC 2018, with local amendments as adopted by the MOA.
  - The IEBC does not require existing buildings, that are not undergoing a change of use or occupancy, to be upgraded to current IBC/ASCE 7 (current building code) force levels and detailing standards. Instead, it sets limits on the amount of mass that can be added (increasing the seismic force) before the building needs to be analyzed to ensure that the building can support the new mass. Until that threshold is reached, the original design and construction is assumed to be acceptable.
  - Under an “Alteration – Level 1” a new 3-psf second roofing layer may be added and no evaluation of the existing structure is required. Although, since Anchorage is in a High Wind Zone, when a reroof occurs, the roof diaphragm connections and roof to wall connection must all be evaluated for a reduced wind load.

  - Under an "Alteration – Level 2" the stress in any gravity or lateral element may be increased up to 10% (per MOA local amendments; and using reduced seismic forces, BSE-2E, or 75% of IBC earthquake forces) without evaluation of the existing structure. Voluntary alterations (retrofits) may be made to the lateral force resisting system under this level of alteration if they do not create (or worsen) an irregularity. See Retrofit, Tier 2 and Tier 3 for more information.
  - "Alterations – Level 3" are separated into substantial and unsubstantial (based on work area as defined by IEBC). Where substantial, the building shall undergo a Whole-Building Evaluation (Tier 3, but with reduced seismic forces, BSE-1E and BSE-2E, or 75% of IBC earthquake forces). Where unsubstantial, refer to Alteration - Level 2. Under all Level 3 Alterations, anchorage of masonry and masonry walls, partitions, and parapets shall be verified.
  - Once a structural Evaluation is required by the IEBC, there are several specified checks and calculations that are required be performed, but the IEBC also allows for an alternate approach called Performance Based Design, such as ASCE 41.
- Performance Based Design
  - Performance Based Design (PBD) is a nuanced design methodology that allows an Owner to select either the Life Safety objective that is built into the building code (IBC/ASCE 7) or elect to use an enhanced performance objective that produces a better outcome after a large ground shaking. ASCE 41 (Tier 2 or 3) is a PBD methodology that is adopted into the IEBC and is approved by the MOA Building Safety Department.
  - Reduced performance objectives with lower outcomes can also be directed by the Owner and accepted by the Engineer and MOA under this methodology.
- Seismic Screening
  - Screenings are relatively quick analyses that allow an Owner to define the relative seismic risk of a building to the other buildings in a given inventory of buildings.
  - Two types are represented in this guide:
    - Rapid Visual Screening (RVS) - This can be used as a preliminary step to the ASCE 41 tiered evaluation. RVS allows for an inventory of buildings to be easily and quickly compared with one another.
    - ASCE 41 Tier 1 Screening – See ASCE 41 Tier 1 below.
- ASCE 41 Tiers
  - ASCE 41, *Seismic Evaluation and Retrofit of Existing Buildings*, is organized as a series of tiers, each more time intensive than the previous.
  - At the time of publication, this guide is based on ASCE 41-17.
  - *Tier 1* – The screening phase. This tier consists of reviewing the existing building versus a **checklist** of 'known deficiencies' that have been shown to be dangerous in previous earthquakes in similar building types. These known deficiencies were acceptable practice when designed and constructed but have since been shown to be seismically vulnerable. Potential deficiencies are checked against acceptable standards and determined to be compliant (C), non-compliant (NC), non-applicable (N/A), or unknown (U). Separate

checklists are used for Collapse Prevention and for Immediate Occupancy performance levels. No other checklists are available for different performance levels. Tier 1 checklists are 'red-flag' checklists and raise only potential concerns, not verified problems that need repair. Non-compliant items may be shown to not need retrofit at the conclusion of a Tier 2 Evaluation.

- *Tier 2* – This **deficiency-only** tier is used for evaluation or retrofit after a Tier 1 screening. Tier 2 allows for the elements deemed non-compliant from Tier 1 to be reevaluated with more-detailed calculations to determine the degree of deficiency. Once the degree of deficiency is determined, a decision can be made on whether each element should be retrofitted.
- *Tier 3* – This is an in-depth, comprehensive structural analysis of the **entire structure**. This analysis does not just look for deficient elements but looks at the interaction of all of the structure's elements. This tier is only used for buildings where the entire structure needs to be upgraded or where buildings do not meet the height limitations for using Tier 1 or 2 evaluations. A Tier 3 retrofit is analogous to a new building design under IBC, IEBC, and ASCE 7, with either full or reduced seismic forces.

- Seismic Hazards
  - The seismic hazard caused by ground shaking is based on a building's geographic location, proximity to faults (earthquake epicenter), and soil properties. The level of the ground shaking observed at the epicenter of an earthquake will be much higher than what is observed at the building. This reduction in intensity depends on distance and soil properties between the epicenter and the building site. There are four specified seismic hazard levels that are tied to the intensity of shaking expected over the 50-year life of a building (mean return period), or put inversely, the probability of a certain intensity of shaking occurring at any one time (probability of exceedance). The seismic hazard level chosen for analysis is dependent on the desired performance objective and can be selected by the Owner of a building. ASCE 41 uses the following predefined hazard levels, or basic safety earthquakes (BSE):
    - Those noted with an '-E' suffix are more applicable to existing buildings, and those with an '-N' suffix are more applicable to new buildings.
    - The hazards noted as '-2' are larger (less frequent/likely) than those noted as '-1' (more frequent/likely).
    - *BSE-2N* – Also known as the Maximum Considered Earthquake, Risk-Targeted (MCE_R), this would be the largest earthquake expected for the area in question. This level of shaking in Anchorage, Alaska could be caused by megathrust faults, such as the Aleutian Subduction Zone, which is capable of M9+ earthquakes. At this intensity of shaking, one would likely see large cracks forming in the ground, significant roadway damage, loss of utilities, and most buildings would be highly damaged.
    - *BSE-1N* – This is 2/3 of the MCE_R, and still a sizeable earthquake. This level of shaking in Anchorage, Alaska could be caused by crustal faults, such as the Castle

Mountain Fault, which is capable of M7+ earthquakes. At this intensity of shaking, one would see ground cracking, damage to houses and office buildings, roadway damage, and underground utility disruption. This is also noted as S_{DS} and S_{D1} (design level earthquake) in IBC/ASCE 7, and new building codes provide life safety performance during this large of a seismic hazard.

- *BSE-2E* – This level of shaking would be a M8+ earthquake caused by crustal faults (like the Denali Fault, although the Denali Fault is too far from Anchorage to create this level of ground shaking in Anchorage). At this intensity of shaking, one would likely see large cracks forming in the ground, significant roadway damage, loss of utilities, and some buildings would be moderately damaged.
- *BSE-1E* –This would be a smaller earthquake than all others considered above but still capable of a lot of damage. This level of shaking could be caused by a crustal fault, such as the Castle Mountain Fault, which can produce M6+ earthquakes on an annual basis. At this intensity of shaking, there would be general alarm and cracks forming in some building shear walls. For buildings with a shorter remaining useful life, less than 20 years, this may be an acceptable reduced seismic hazard.

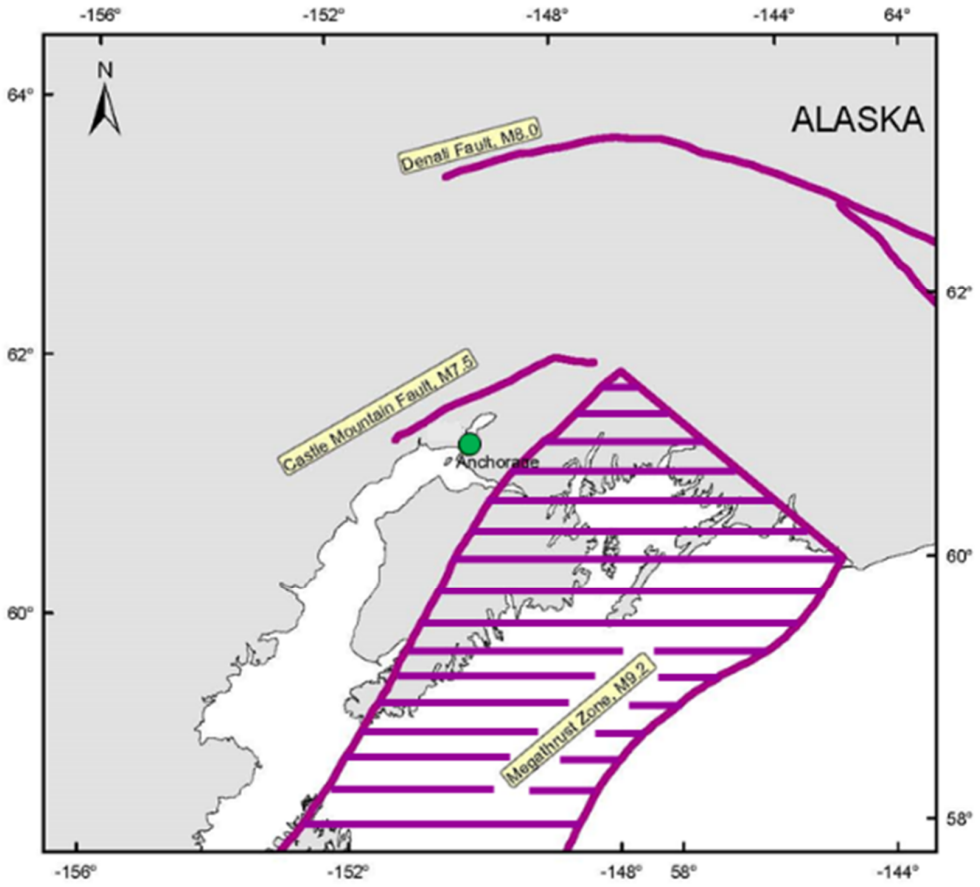


Figure 1: Faults near Anchorage capable of producing high magnitude earthquakes.

- For Anchorage, Alaska, using the *ATC Hazard by Location* tool (https://hazards.atcouncil.org/), and Site Class C, the seismic accelerations (at a short period of 0.2 seconds, S_{XS}, and a longer period of 1.0 seconds, S_{X1}) of the seismic hazards above are:

Seismic Hazard	*Probability of Exceedance*	*Mean Return Period*	S_{XS}	S_{X1}
BSE-2N (MCE_R)	*2% in 50 years*	*2475 years*	*1.800g*	*0.947g*
BSE-1N	*2/3 of BSE-2N (~10% in 50 years)*	*475 years*	*1.200g*	*0.631g*
IBC/ASCE 7 (RC III), current code, S_{DS}, S_{D1}				
BSE-2E	*5% in 50 years*	*975 years*	*1.563g*	*0.832g*
BSE-1E	*20% in 50 years*	*225 years*	*0.945g*	*0.491g*

Table 1: Seismic Accelerations of Anchorage, AK at Predefined Seismic Hazard Levels.

- Performance Level
  - These are the levels at which a building should perform under a given seismic hazard. Levels of performance exist for both structural and nonstructural components.
  - *Structural* – Structural refers to all elements and systems that make up the building's gravity and lateral force resisting system. Structural components would include such items as shear walls, roof deck, braced frame, etc. Structural performance levels are classified with an 'S-' prefix followed by a number, with a lower number representing a better performance.
    - *Immediate Occupancy (S-1)* - The structure will retain the pre-earthquake strength and stiffness and can be utilized immediately. Few to no injuries should occur to persons within the structure due to building failure. (Figure 2).
    - *Damage Control (S-2)* – Some damage will occur to the building, with small permanent drift. Damage should be economical to repair. Building is capable of being occupied following shaking, but damage should be addressed as soon as feasible.

Figure 2: Immediate Occupancy (S-1) - Note damage to facade, but underlying structural brick in working condition.

- *Life Safety (S-3)* – Moderate damage will be present in the building, with some residual strength left in the elements. Minor permanent drift will be present. The building may be beyond economical repair (Figure 3). Injuries due to structural failure should be few.

Figure 3: Life Safety (S-3) - Cracking/deflection in concrete beam, cannot be repaired.

- *Limited Safety (S-4)* – Moderate to severe damage. The building will have permanent drift and will be beyond economical repair. The building should not be reused following an earthquake. Damage to structure may cause injuries or obstacles to evacuation, but these should be minor.
- *Collapse Prevention (S-5)* – Severe damage is present throughout the structure. Little residual strength and stiffness remains, but load-bearing columns and walls should function. Large permanent drifts exist in the structure and exits may be blocked. Building is near collapse. This is a hazard to human safety and will not be reusable (Figure 4). Risk of injury due to structural damage is high.

Figure 4: Collapse Prevention (S-5) - Severe buckling of members, near collapse.

- *Nonstructural* – Nonstructural refers to all aspects of a structure that do not provide structural support. This would include architectural elements (soffits, moldings, and drop ceilings), mechanical elements (boilers, generators, and HVAC; Figure 5), and electrical components (fans and lights). Nonstructural levels are classified with an 'N-' prefix followed by a letter from A to D, with the lower order letters representing a higher performance.
  - *Operational (N-A)* – Elements will resume pre-earthquake functions without repair. Power and utilities are available, possibly from a standby source.
  - *Position Retention (N-B)* – Elements are damaged and may not function but are secured in place following an earthquake. May require repair or replacement before reuse.

- *Life Safety (N-C)* – Elements are damaged and may be dislodged from positions, though the consequences of damage do not pose a high risk to life safety, e.g., items are not major falling hazards and will remain anchored until repaired or replaced.
- *Hazards Reduced (N-D)* – Elements are damaged, will require replacement, and could become falling hazards.

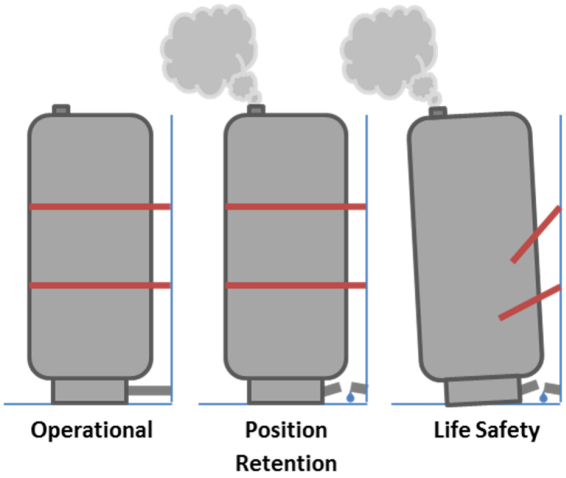


Figure 5: Example of performance levels for nonstructural element (water heater).

- Performance Objectives
  - Performance Objectives are the combination of Seismic Hazard and Structural and Nonstructural Performance Levels. Performance Objectives are abbreviated as 'S-N', dropping the 'S-' and 'N-' prefixes.
  - These are overlaid below on the Risk Categories defined by IBC and ASCE 7 and are defined by ASCE 41 as the Basic Performance Objective for Existing Buildings (BPOE).
  - The Owner can select to use a higher or lower performance objective for any element or building, if the IEBC does not require retrofit.

Risk Category (IBC)	BSE-1E		BSE-2E	
I and II	Structural: Life Safety (S-3) Nonstructural: Life Safety (N-C)	3-C	Structural: Collapse Prevention (S-5) Nonstructural: Hazards reduced (N-D)	5-D
III	Structural: Damage Control (S-2) Nonstructural: Position Retention (N-B)	2-B	Structural: Limited Safety (S-4) Nonstructural: Hazards reduced (N-D)	4-D
IV	Structural: Immediate Occupancy (S-1) Nonstructural: Position Retention (N-B)	1-B	Structural: Life Safety (S-3) Nonstructural: Hazards reduced (N-D)	3-D

Table 2: Basic Performance Objective for Existing Buildings (BPOE).

B. Rapid Visual Screening

Pre-Screening

In order to conduct Rapid Visual Screening (RVS) per FEMA 154, the following data should be collected for each school:

- Construction drawings and as-built drawings
  - Floor area (sq.ft.)
  - Building type
  - Building height
  - Irregularities (Plan/Vertical)
  - Year(s) of construction/design
- Soil type (A,B,C,D,E,F)
- Field study
  - Falling hazards
  - Occupancy (No. of persons)
  - Verify as-built drawings

Rapid Visual Screening

Fill out the Rapid Visual Screening FEMA-154 Data Collection Form for High Seismicity. The form should be filled out during the site visit to each school.

Basic Score

The basic score is based on the building type. The building type is determined from the as-built drawings and a site visit for verification.

Building Height

The height of the building is used to modify the basic score through two checks: Mid Rise (4 to 7 stories) and High Rise (>7 stories). These modifiers are only used if the building fits within these criteria.

Irregularities

Irregularities (vertical or plan) should be determined from the as-built drawings and verified through the site visit.

Year of Design

There have been great changes in the seismic code over the years. The importance of the code the building was designed under is also given weight through two modifiers: Pre-Code and Post-Benchmark.

The earliest code that MOA has on record as acceptable for seismic considerations is the UBC 1946, adopted on June 9, 1948. Buildings designed before this year are considered “Pre-Code” for FEMA 154. Buildings constructed before 1984 were not subject to the rigorous review now present in the MOA and should use a value of one-half of the “Pre-Code” value listed in FEMA 154, e.g., a 1942 S-4 would receive an -0.8; a 1970 S-4 would use ½ * -0.8 = -0.4.

Specific building types have benchmark years, or benchmark codes, that were deemed reliable for seismic design. The date that the MOA accepted these codes is the date after which all buildings are considered to surpass the "Benchmark Design Year". See Table 4 for specific building types, their representative benchmark years, and the date that the MOA accepted the benchmark year code.

Building Code	Benchmark Designation	Effective Date in the MOA
UBC	1976	5/9/1978
	1988	1/24/1989
	1991	2/25/1992
	1994	5/31/1995
	1997	12/15/1998
IBC	2000	1/28/2003
	2003	11/1/2005
	2006	1/29/2008

Table 3: Date after which Benchmark Codes were accepted into MOA.

Buildings designed after their respective codes were accepted by the MOA are considered "Post Benchmark" for FEMA 154. The UBC was utilized until 2003, and the IBC has been used since that time. Previous retrofit codes are also considered benchmarks. A building can be benchmarked under any of these building codes, e.g., a W1a building designed to the 1997 UBC, the 2000 IBC, or previously retrofit to the 1998 FEMA 310 are all considered "Post Benchmark".

	Building Seismic Design Provisions		Seismic Evaluation or Retrofit Provisions	
Building Type[a,b,c]	UBC	IBC	FEMA 310[d] (1998e)/ ASCE 31[d]	FEMA 356[e] (2000)/ ASCE 41[e]
Wood frame, wood shear panels (Types W1 and W2)	1976	2000	1998	2000
Wood frame, wood shear panels (Type W1a)	1997	2000	1998	2000
Steel moment-resisting frame (Types S1 and S1a)	1994[g]	2000	1998	2000
Steel concentrically braced frame (Types S2 and S2a)	1997	2000	1998	2000
Steel eccentrically braced frame (Types S2 and S2a)	1988[g]	2000	[f]	2000
Buckling-restrained braced frame (Types S2 and S2a)	[f]	2006	[f]	2000
Metal building frames (Type S3)	[f]	2000	1998	2000
Steel frame with concrete shear walls (Type S4)	1994	2000	1998	2000
Steel frame with URM infill (Types S5 and S5a)	[f]	2000	1998	2000
Steel plate shear wall (Type S6)	[f]	2006	[f]	2000
Cold-formed steel light-frame construction—shear wall system (Type CFS1)	1997[h]	2000	[f]	2000[h]
Cold-formed steel light-frame construction—strap-braced wall system (Type CFS2)	[f]	2003	[f]	[f]
Reinforced concrete moment-resisting frame (Type C1)[i]	1994	2000	1998	2000
Reinforced concrete shear walls (Types C2 and C2a)	1994	2000	1998	2000
Concrete frame with URM infill (Types C3 and C3a)	[f]	2000	1998	2000
Tilt-up concrete (Types PC1 and PC1a)	1997	2000	1998	2000
Precast concrete frame (Types PC2 and PC2a)	[f]	2000	1998	2000
Reinforced masonry (Type RM1)	1997	2000	1998	2000
Reinforced masonry (Type RM2)	1994	2000	1998	2000
Unreinforced masonry (Type URM)	[f]	2000	[f]	2000
Unreinforced masonry (Type URMa)	[f]	2000	1998	2000
Seismic isolation or passive dissipation	1991	2000	[f]	2000

Note: NBC = *National Building Code.* SBC = *Standard Building Code.* UBC = *Uniform Building Code.* IBC = *International Building Code.* NEHRP = FEMA 368 and 369, *NEHRP Recommended Provisions for the Development of Seismic Regulations for New Buildings* (BSSC 2000), FEMA 178, FEMA 310, FEMA 356, ASCE 31-03, ASCE 41-06, and ASCE 41-13.
[a] Building type refers to one of the common building types defined in Table 3-1.
[b] Buildings on hillside sites shall not be considered Benchmark Buildings.
[c] For buildings in Very Low Seismicity, the benchmark provisions shall be limited to the IBC, FEMA 310/ASCE 31, and FEMA 356/ASCE 41.
[d] Life Safety Structural Performance Level for the seismic hazard as defined by those provisions.
[e] Life Safety Structural Performance Level for the BSE-1 seismic hazard as defined by those provisions.
[f] No benchmark year; buildings shall be evaluated using this standard.
[g] Steel moment-resisting frames and eccentrically braced frames with links adjacent to columns shall comply with the 1994 UBC Emergency Provisions, published September/October 1994, or subsequent requirements.
[h] Cold-formed steel shear walls with wood structural panels only.
[i] Flat slab concrete moment frames shall not be considered Benchmark Buildings.

Table 4: Benchmark Codes (Table 3-2 excerpt from ASCE 41-17).

Soil Type

Soil type plays an important role in the seismic stability of a building. If there are soil reports available to help one determine the soil type, that soil type should be used in this analysis for scoring the school.

When a soil report is unavailable to determine the soil type, correlation of the Ground Failure Susceptibility for Anchorage (See Appendix 1) may be used. The following correlation is acceptable:

Map Color	Hazard Zone	Approximate Soil Type
Dark green	'Lowest' Hazard Zone	Soil Type D
Light green	'Moderate-Low' Hazard Zone	Soil Type D
Yellow	'Moderate' Hazard Zone	Soil Type D
Orange	'High' Hazard Zone	Soil Type E
Red	'Very High' Hazard Zone	Soil Type F see note below

Table 5: Ground Failure Susceptibility Conversion to Soil Type.

Schools within the Red, 'Very High' Hazard Zone, or having Soil Type F should be given an automatic final score, S, of negative one (-1.0), because the building cannot be effectively screened by an RVS. Schools in the 'Very High' Hazard Zone require further evaluation by a geotechnical engineer.

Final Score, S

A final seismic score will be determined (S). The lower the number, the larger the probability that the school's lateral system is not adequate.

For example, a school with a seismic score S of 2 would have a 1 in 10^2 (1 out of 100) chance of failure during a BSE-2N event. A school with a seismic score of 3 would have a 1 in 10^3 (1 out of 1000) chance of failure during a BSE-2N event.

Deliverables

The FEMA 154 RVS final output for schools should be a table that includes the following:

- School Name
- Grade Level
- Year Constructed
- Building Type
- No. of Stories
- Area (sq. ft.)
- Ground Failure Susceptibility
- Soil Type (note if correlated from Ground Failure Susceptibility for Anchorage map)
- FEMA 154 Seismic Score (S)
- Further Evaluation, Yes/No

Any building with a seismic score at or below 2.5 should be considered high risk and should be evaluated further. Anything above 2.5 may be considered at moderate or low risk, but seismic deficiencies may still exist.

All data collection forms should be included. Additional reports or memos for clarification of specific schools or the screening conducted overall should be included in the deliverables as well.

C. Screening - Tier 1

Pre-Screening

- Confirm with ASD if any nonstructural items should be added to the checklists (See Appendix 2)
- Review as-built and construction drawings.
    - Make note of any and all missing drawings.
- Collect all available previous testing and investigation documentation.
    - If an RVS was conducted prior to this evaluation, the report should be reviewed for pertinent information such as building type, soil type, and any noted areas of structural distress or damage.
- Identify Ground Failure Susceptibility based on the map provided in Appendix 1.
- Review available geotechnical information for the building site or other sites nearby.

Screening Criteria

- Level of Seismicity: High
- Earthquake Hazard: BSE-2E
- Where material properties are not specified on the available drawings, utilize Default Material Properties from ASCE 41.
- BPOE for Schools (Risk Category III) in the Anchorage School District:

Structural	Nonstructural
Limited Safety*	Hazards Reduced** (or compliance with ASCE 7 standards)
*For Tier 1 Screening, use Collapse Prevention checklists and modify Ms factors in Quick Check Calculations to be an average of Life Safety and Collapse Prevention values. **Position Retention NS performance also required at BSE-1E; therefore in NS checklist, provide status for all items, even those listed as 'HR-not required' and 'PR-H'	

Table 6: BPOE Level of Performance for Tier 1 Screening

- Note that many schools are deemed as District Designated School Shelters (DDSS) per the ASD Emergency Preparedness Plan. This does not mean that they are to be designed to Risk Category IV or Immediate Occupancy performance objectives unless specifically directed by ASD.

Screening Tasks

1. Conduct a field assessment of the building.
    a. Confirm the existing construction with the as-built drawings.
    b. Note critical details such as areas of structural distress or damage.
    c. Identify structural movement/distress if settlement problems are identified.
    d. Evaluate nonstructural components.

2. Fill out the following checklists:
    a. Basic Configuration Checklist
    b. Structural **Collapse Prevention** Checklist for all building types
        i. A school building will often have two or three building types, including additions and renovations, and a checklist for all applicable building types and additions must be completed.
    c. Nonstructural Checklist
        i. If items have been noted as Enhanced Objectives (See Appendix 2), then specifically add those items to the checklist.
3. Provide sufficient evaluation to eliminate all "UNKNOWN" answers, if possible.
    a. If UNKNOWN items cannot be resolved, coordinate with ASD prior to issuing report. Provide a thorough description of why the item remains unknown and specifically identify what is needed (destructive evaluation, material testing, etc.) to confirm compliance or non-compliance. Provide a sketch of the locations where additional evaluation is needed along with a schedule of how many locations, tests, etc., are needed to resolve the unknown.
4. Provide quick check calculations that are required by checklists.
    a. For Limited Safety Performance Objective (typical for ASD schools), use Collapse Prevention checklists and modify Ms factors to be an average of Life Safety and Collapse Prevention values.
5. Give priority rating to all elements/components deemed deficient (See Appendix 4 and Appendix 5).
    a. Tier 1 checklists are 'red-flag' checklists and raise only potential concerns, not verified problems that need repair. Non-compliant items may be shown to not need retrofit at the conclusion of the Evaluation.
6. For each of the noncompliant deficiencies, develop schematic level (10%) concepts for retrofit.

Deliverables

The Screening may be done as a standalone project or as part of a larger Screening & Evaluation project. If part of a Screening & Evaluation project, no specific screening deliverable is needed.

If standalone, create a Screening Report (Tier 1) that includes the following:

1. Document review (existing drawings, new or existing soils report, etc.).
    a. Note any missing documentation.
2. General and structural building description and description of nonstructural elements of interest.
3. List of assumptions.
4. Description of gravity and lateral structural systems present in building (sketches/diagrams as necessary).
    a. If building consists of multiple renovations and additions, provide description of each and a key map to indicate the extents of each.

5. Field assessment information, including areas of structural distress or damage.
6. Summarize any soil data reviewed and the condition of soils on site during field survey. Report Ground Failure Susceptibility (Appendix 1).
7. Statement of design criteria under original design building code (for each part/generation/addition) and current IBC and the percentage change between the two.
    a. Roof Snow Load
    b. Wind Load
    c. Earthquake Load
8. Statement of seismic evaluation criteria.
    a. Level of Seismicity
    b. Earthquake Hazard Levels
    c. Performance Objectives (BPOE or other/enhanced)
9. Prioritized lists of noncompliant items divided into structural (See Appendix 4) and nonstructural component lists (See Appendix 5). Also, separate those items into groups that could be retrofit with other common projects such as reroofing, residing, or maintenance.
10. Concept narrative to retrofit deficiencies. Provide sketches, as necessary, to illustrate location and extent of concept retrofit. Develop retrofit to 10% of completion.
11. Completed seismic evaluation checklists from ASCE 41 and structural quick check calculations (Append).

The report is to be presented to the ASD. Meet with ASD to discuss the screening, ranking, grouping, and the conceptual retrofit design, as well as possible retrofit alternatives.

D. Evaluation - Tier 2 or Tier 3

Pre-Evaluation

- Confirm with ASD if any nonstructural items are subject to Enhanced Objectives (See Appendix 2).
- Review as-built and construction drawings.
    - Make note of all missing drawings.
- Collect all available previous testing and investigation documentation.
    - If an RVS was conducted prior to this evaluation, the report should be reviewed for pertinent information such as building type, soil type, and any noted areas of structural distress or damage.
    - A Tier 1 Screening is required to define the scope for a Tier 2 Deficiency-Only Evaluation.
        - If part of a Screening & Evaluation report, this work will be done just prior to this Evaluation step.
    - A Tier 3 Whole Building Evaluation does not require a previous Tier 1 report.
- Identify Ground Failure Susceptibility based on the map provided in Appendix 1.
- Review available geotechnical information for the building site or other sites nearby.

Evaluation Criteria

- Where material properties are not specified on the available drawings, utilize Default Material Properties from ASCE 41.
- Knowledge factor: 0.75 per ASCE 41, unless 'usual material testing' is performed as outlined in ASCE 41.
- BPOE for Tier 2 Deficiency-Only Evaluations of Schools (Risk Category III) in the Anchorage School District (referred to as 'reduced seismic forces' by IEBC):

<table>
<tr><td colspan="2">BSE-2E</td></tr>
<tr><td>Structural:
Limited Safety (S-4) *</td><td rowspan="2">4-D</td></tr>
<tr><td>Nonstructural:
Hazards Reduced (N-D) **</td></tr>
<tr><td colspan="2">*For Tier 2 Evaluation, modify factors to be an average of Life Safety and Collapse Prevention values.
**Position Retention NS performance also required at BSE-1E</td></tr>
</table>

Table 7: BPOE Level of Performance for Tier 2 Evaluation.

- BPOE for Tier 3 Whole-Building Evaluations of Schools (Risk Category III) in the Anchorage School District includes two objectives (referred to as 'reduced seismic forces' by IEBC):

<table>
<tr><td colspan="2">BSE-1E</td><td colspan="2">BSE-2E</td></tr>
<tr><td>Structural:
Damage Control (S-2)</td><td rowspan="2">2-B</td><td>Structural:
Limited Safety (S-4)</td><td rowspan="2">4-D</td></tr>
<tr><td>Nonstructural:
Position Retention (N-B)</td><td>Nonstructural:
Hazards reduced (N-D)</td></tr>
</table>

Table 8: BPOE Level of Performance for Tier 3 Evaluation.

- Note that many schools are deemed as District Designated School Shelters (DDSS) per the ASD Emergency Preparedness Plan. This does not mean that they are to be designed to Risk Category IV or Immediate Occupancy performance objectives unless specifically directed by ASD.

Tier 2 Evaluation

1. Conduct Tier 2 Evaluation of non-compliant and unknown checklist items. Do not evaluate compliant or not applicable checklist items.
2. Give priority rating to all elements/components still deemed noncompliant (see Appendix 4 and Appendix 5).
3. For each of the remaining noncompliant items, develop schematic level (35%) concepts for retrofit.

Tier 3 Evaluation

1. This level of evaluation is rare and should only occur if specifically directed by ASD.
2. Conduct Tier 3 Evaluation of the entire building, considering all vertical and horizontal elements and connections of the lateral force resisting system.
3. Give priority rating to all elements/components deemed noncompliant (see Appendix 4 and Appendix 5).
4. For each noncompliant item, develop schematic level (35%) concepts for retrofit.

Deliverables

The Evaluation may be done as a standalone project or as part of a larger Screening & Evaluation project.

Create a Tier 2 Deficiency-Only (or Tier 3 Whole Building) Evaluation report to include the following:

1. Document review (existing drawings, new or existing soils report, etc.).
    a. Note any missing documentation.
2. General and structural building description and description of nonstructural elements of interest.
3. List of assumptions.
4. Description of gravity and lateral structural systems present in building (sketches/diagrams as necessary).
    a. If building consists of multiple renovations and additions, provide description of each and a key map to indicate the extents of each.
5. Field assessment information, including areas of structural distress or damage and material test results (if material tests conducted).
6. Summarize any soil data reviewed and the condition of soils on site during field survey. Report Ground Failure Susceptibility (Appendix 1).
7. Statement of design criteria under original design building code (for each part/generation/addition) and current IBC and the percentage change between the two.
    a. Roof Snow Load

   b. Wind Load
   c. Earthquake Load
8. Statement of seismic evaluation criteria.
   a. Level of Seismicity
   b. Earthquake Hazard Levels
   c. Performance Objectives (BPOE or other/enhanced)
9. For Tier 2 Deficiency-Only Evaluations, list all previously identified Tier 1 deficiencies. Note whether the Tier 2 calculations verified or nullified the Tier 1 concern.
   a. If part of a Screening & Evaluation project, include all Screening Report deliverable items in the Screening & Evaluation Report.
10. Prioritized lists of remaining noncompliant items divided into structural (See Appendix 4) and nonstructural component lists (See Appendix 5). Also, separate those items into groups that could be retrofit with other common projects such as reroofing, residing, or maintenance.
11. Schematic narrative to correct deficiencies that provides adequate information to develop a cost estimate (by others). Provide sketches to illustrate location and extent of schematic repair. Develop retrofit to 35% of completion.
12. Calculations for building mathematical model, seismic accelerations, irregularities, multi-directional effects, P-delta effects, overturning, diaphragm, continuity, out-of-plane wall forces and anchorages, confirmation of material capacities, and other items as appropriate (Append).

The report is to be presented to the ASD. Meet with ASD to discuss the screening, ranking, grouping, and the conceptual retrofit design, as well as possible retrofit alternatives.

E. Retrofit - Tier 2 or Tier 3

Pre-Retrofit

- Collect all available previous testing and investigation documentation.
  - A Tier 2 Retrofit requires a Tier 2 Deficiency-Only Evaluation to have been completed.
  - A Tier 3 Retrofit requires a Tier 3 Whole Building Evaluation to have been completed.
- Since most retrofits are voluntary, ASD shall identify which noncompliant items are to be retrofit in any project. If the IEBC requires any retrofits, ASD and/or Engineer to identify them as such.

Retrofit Criteria

- All new items shall be designed per the IBC and ASCE 7.
- All retrofitted items shall be upgraded to the Basic Performance Objective for New Buildings (BPON).
- BPON for School Retrofits (Risk Category III) in the Anchorage School District includes two objectives (referred to as 'full seismic forces' by IEBC, IBC, and ASCE 7):

<table>
<tr><td colspan="2">BSE-1N</td><td colspan="2">BSE-2N</td></tr>
<tr><td>Structural:
Damage Control (S-2)</td><td rowspan="2">2-B</td><td>Structural:
Limited Safety (S-4)</td><td rowspan="2">4-D</td></tr>
<tr><td>Nonstructural:
Position Retention (N-B)</td><td>Nonstructural:
Hazards reduced (N-D)</td></tr>
</table>

Table 9: BPON Level of Performance for Tier 2 or Tier 3 Retrofit.

- Note that many schools are deemed as District Designated School Shelters (DDSS) per the ASD Emergency Preparedness Plan. This does not mean that they are to be designed to Risk Category IV or Immediate Occupancy performance objectives unless specifically directed by ASD.

Tier 2 Retrofit

1. Design Tier 2 Retrofit of items that are still noncompliant after the Tier 2 Deficiency-Only Evaluation.
2. Provide stamped, signed drawings, specifications, and calculations per the typical ASD project delivery matrix.
3. Provide fully developed details for the retrofit of all items designated by ASD to be included in this voluntary retrofit project.
4. Confirm renovation items are compliant with IEBC. If some items are mandatory retrofits due to level of alteration, inform ASD and note on contract documents as such.

Tier 3 Retrofit

1. Design Tier 3 Retrofit of items that are deemed non-compliant at the completion of the Tier 3 Whole-Building Evaluation.
2. Provide stamped, signed drawings, specifications, and calculations per the typical ASD project delivery matrix.

3. Provide fully developed details for the retrofit of all items designated by ASD to be included in this voluntary retrofit project.
4. Confirm renovation items are compliant with IEBC. If some items are mandatory retrofits due to level of alteration, inform ASD and note on contract documents as such.

Deliverables

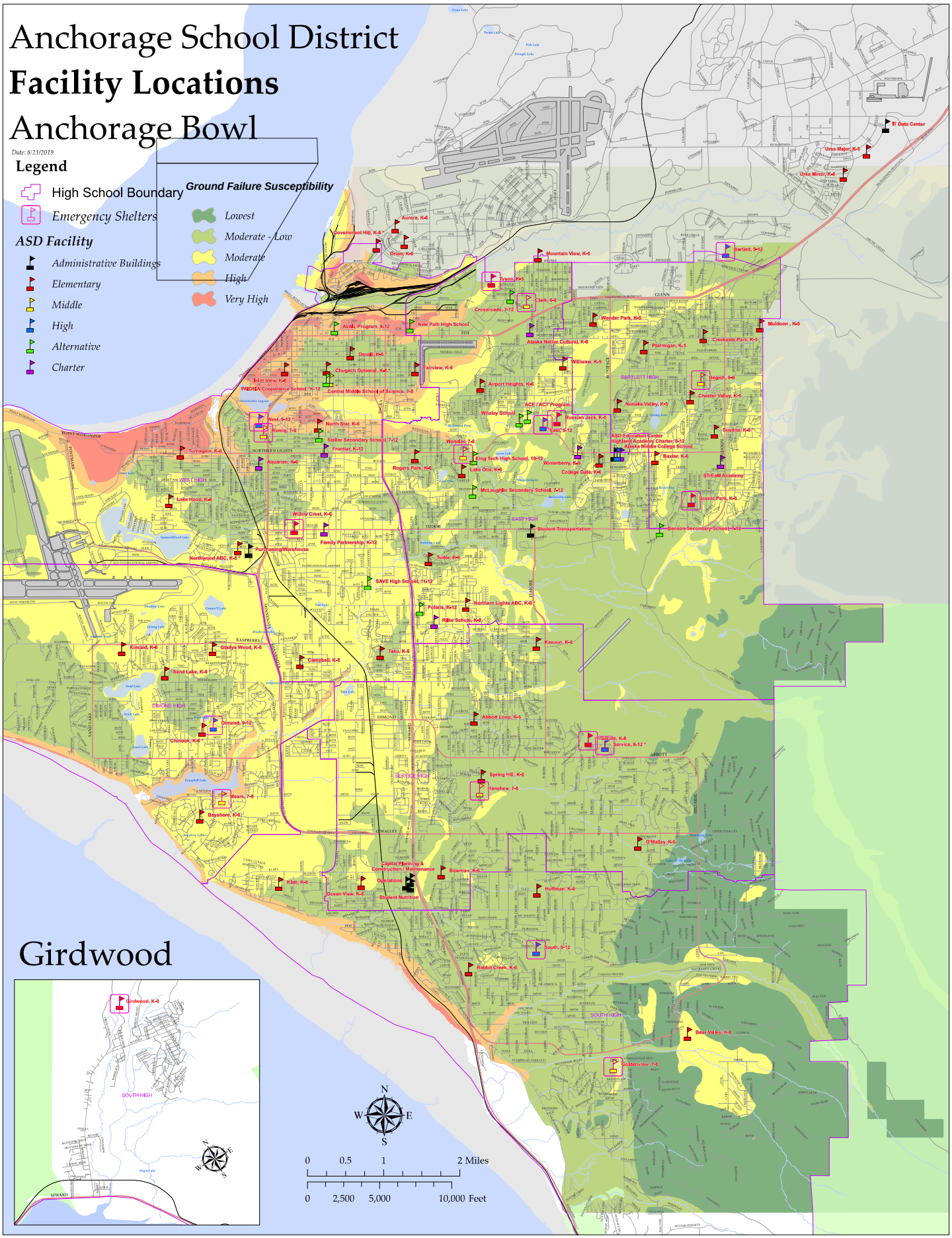
1. Plans, Elevations, and Details to fully describe scope of retrofit, stamped by an Alaska-registered Structural Engineer.
2. Narrative describing deficiencies found in previous reports and detailed explanation of how and to what extent this retrofit strengthens those deficiencies. Include a list of assumptions.
3. Updated priority ranking of un-retrofitted remaining noncompliant items divided into structural (See Appendix 4) and nonstructural component lists (See Appendix 5). Also, separate those items into groups that could be retrofit with other common projects such as reroofing, residing, or maintenance.
4. Calculations for building mathematical model, seismic accelerations, irregularities, multi-directional effects, P-delta effects, and all repairs/retrofits.

Appendix 1 – Anchorage Ground Failure Susceptibility

The following map was developed by Harding and Lawson in 1979 after the 1964 Good Friday Earthquake to estimate the regions of soil in and around the Anchorage Bowl that may be susceptible to landslides under a similar magnitude and origin of earthquake. This was reaffirmed by the USGS in 2009.

- 'Very High' Hazard Zone – Areas of previous seismically induced landslides. Includes zones of tension cracks above the head wall scarp, toe bulge, and pressure ridge areas. Although portions of these previous slides may remain relatively undisturbed from future strong shaking, these slides will be the more likely site of future seismically induced sliding.
    - Red zone
    - >15cm of Newmark displacement, >32% chance of landslide occurrence.
- 'High' Hazard Zone – Fine-grained surficial and subsurface deposits within the vicinity of steep slopes; includes area above and below the slope. Highly susceptible to all types of seismically induced ground failure, including liquefaction, translational sliding, lurching, land spreading, cracking, and subsidence.
    - Orange zone
    - 5-15cm of Newmark displacement, 15%-32% chance of landslide occurrence.
- 'Moderate' Hazard Zone – Fine-grained surficial and subsurface deposits, including the Bootlegger Cove Clay and other silt, clay, and peat deposits. May experience ground cracking and horizontal ground movement due to land spreading or lurching and subsidence due to consolidation.
    - Yellow zone
    - 1-5cm of Newmark displacement, 2%-15% chance of landslide occurrence.
- 'Moderate-Low' Hazard Zone – Mixed coarse and fine-grained glacial deposits in lowland areas, thick deposits of channel, terrace, flood plain, and fan alluvium. May have very low susceptibility; may experience minor ground cracking, localized settlement due to consolidation, and perhaps liquefaction or lurching of localized saturated zones of fine-grained material.
    - Light green zone
    - 0-1cm of Newmark displacement, <2% chance of landslide occurrence.
- 'Lowest' Hazard Zone – Includes exposed bedrock, thin alluvium and colluvium over bedrock. May experience minor ground cracking and acceleration of normal mass wasting process in unconsolidated material such as rock falls and snow avalanches.
    - Dark green zone

While this map is a decent approximation of the soil class and seismic site geotechnical risk, it is not the authority. Site borings and geotechnical reports should be relied upon whenever possible during seismic screenings, evaluations, and retrofits.


Anchorage School District
Facility Locations
Anchorage Bowl
Date: 8/21/2019
Legend
High School Boundary
Emergency Shelters
ASD Facility
Administrative Buildings
Elementary
Middle
High
Alternative
Charter
Ground Failure Susceptibility
Lowest
Moderate - Low
Moderate
High
Very High
Girdwood
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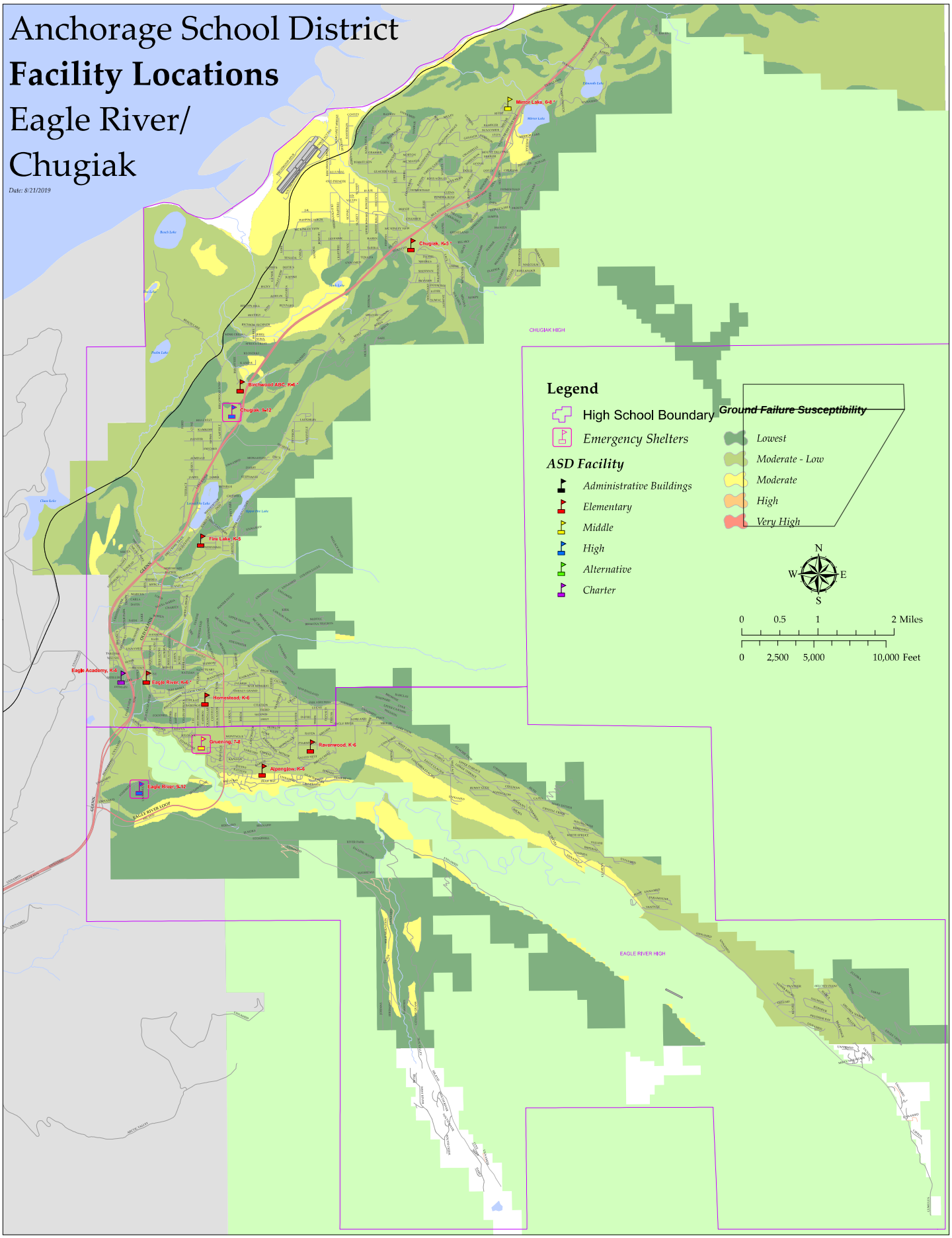
0 0.5 1 2 Miles
0 2,500 5,000 10,000 Feet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0 0.5 1 2 Miles
0 2,500 5,000 10,000 Feet
CHUGIAK HIGH
EAGLE RIVER HIGH
Mirror Lake, K-8
Chugiak, K-5
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Eagle River, K-5
Homestead, K-6
Gruening, 7-8
Ravenwood, K-6
Alpenglow, K-6
Eagle River, 9-12

Appendix 2 – Commonly Specified Enhanced Performance Objectives for Nonstructural Items

This form to be provided by ASD to the Engineer prior to starting the Screening, Evaluation and Retrofit stages to ensure any enhanced objectives are accounted for. At the Screening stage, this list is to ensure these items are explicitly added to the Nonstructural checklists and report, and compliance or non-compliance is noted. At the Evaluation and Retrofit stages, the **Operational** at **BSE-1N** performance objective is explicitly evaluated and retrofit if needed.

The following list of nonstructural components should be included in the enhanced performance objectives for this school:

☐ Standby generator

☐ Dual fuel boilers

☐ HVAC equipment

☐ Fire sprinkler system / Fire pumps

☐ File cabinets / bookshelves

☐ Battery racks

☐ Suspended ceilings

☐ Light fixtures

☐ Plumbing / Piping

☐ Ductwork

☐ Raised floor system

☐ Natural gas shutoff

☐ Other:

__ Artwork (only if high value or falling hazard)

__ DDSS Supply Storage (conex or other)

__

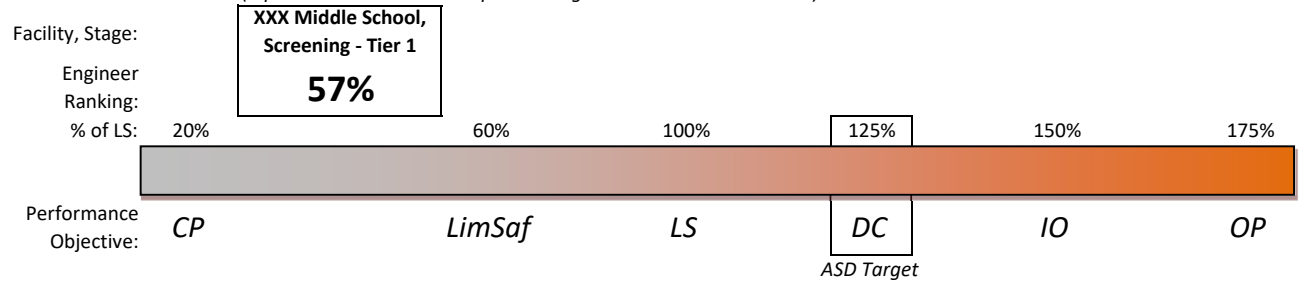
__

Appendix 3 – Seismic Performance Assessment Scale

The following figure is to be included in all Screening, Evaluation, and Retrofit reports and narratives.

While much of this scale is dependent upon engineering judgement, guidelines for how it should be applied are:

- Each performance level correlates to a rating from 20% - 175%, where 100% is a standard new code compliant office building or retail store (Risk Category II).
    - Collapse Prevention (CP) = 20%
    - Limited Safety (LimSaf) = 60%
    - Life Safety (LS) = 100%
    - Damage Control (DC) = 125%
    - Immediate Occupancy (IO) = 150%
    - Operational (OP) = 175%
- Based on the size (square footage) of additions and generations of the building, average the rankings to determine an overall school ranking.
- Based on the Demand-Capacity Ratios under the **BSE-1N**, for each portion of a building, rank those portions relative to their number scale, e.g., if a building has a few deficient items, but is mostly adequate, it would be ranked just below the Life Safety metric, 90%.
    - Note that the BSE-1N is a lower Seismic Hazard than the BSE-2E hazard used under the Tier 1 Screening and Tier 2 Deficiency-Only Evaluation. Per Table 1, you can transition between the two by multiplying by 0.76 (ratio of BSE-1N S_{XS} to BSE-2E S_{XS}). Therefore, if the BSE-2E ranking is just above Limited Safety (68%), the BSE-1N ranking that would be reported would be 68/0.76 = 90%, just below Life Safety.
    - Since the seismic hazard used in the early screenings and evaluations under previous versions of ASCE 41 used the BSE-1N, the Building Seismic Ranking will maintain that seismic hazard for reporting purposes and cross-report comparisons.
- For the retrofit reports and narratives, re-rank the building at the **BSE-1N** hazard based on the condition after the retrofits are complete.
- The target performance objective for school buildings in ASD (Risk Category III) is 125%, Damage Control.



Notes:

1. CP = Collapse Prevention; LimSaf = Limited Safety; LS = Life Safety; DC = Damage Control; IO = Immediate Occupancy; OP = Operational.

2. The "Engineer Ranking" indicated above is a qualitative assessment based on the extent of noncompliant items identified in a Tier 1 Screening and the experience of the Engineer. No published standard for the quantitative assessment of existing buildings is used, other than ASCE-41. The assignment of CP=20%, LimSaf=60%, LS=100%, DC=125%, IO=150% and OP=175% is at the discretion of ASD. The target ranking of all ASD facilities is 125% (Damage Control at BSE-1N).

3. Engineer to adjust 'engineer ranking' row to place a percentage calculated for this facility, centered above the range where that percentage lies on the scale.

Appendix 4 – Structural Deficiency Priority Ranking

The Priority Ranking is a way to help determine the order in which deficiencies should be addressed. All elements with a rating above zero should be addressed, but this will allow the retrofit to be prioritized. Structural deficiencies should be rated in the following three categories: degree of deficiency, prevalence, and degree of threat.

Degree of Deficiency

The percent of nonconformance should be taken into consideration when prioritizing the deficiencies. Anything considered "code deficient" should be ranked a 5. Use the following six-point scale to rate the degree of deficiency.

0 – Elements loaded less than or equal to member capacity (<100%).
1 – Elements loaded less than 10% above member capacity (<110%).
2 – Elements loaded less than 20% above member capacity (<120%).
3 – Elements loaded less than 35% above member capacity (<135%).
4 – Elements loaded less than 50% above member capacity (<150%).
5 – Elements loaded greater than 50% of member capacity or deemed "code deficient".

Prevalence

It is important to recognize how many times this element or connection is repeated throughout the building. Prevalence allows the priority rating to include the amount of the structure that has the element problem described. Use the following five-point scale to rate the prevalence of all deficient elements.

1 – Present in 0-10% of the building.
2 – Present in 10-25% of the building.
3 – Present in 25-50% of the building.
4 – Present in 50-80% of the building.
5 – Present in 80-100% of the building.

Degree of Threat

Allowing for engineering judgment, the degree of threat is for including what would happen should this member fail. The threat or hazard to structural integrity should this element fail should be rated on the following four-point scale.

1 – The problem is not critical to structural integrity.
2 – The problem will create minor problems nearby but does not affect structural integrity.
3 – The problem will create problems nearby and will affect structural integrity.
4 – The problem will create major problems and affect structural integrity of many other members and the system.

By taking the product of the three categories above (deficiency X prevalence X threat), each noncompliant item will be rated on a scale of 0 to 100, creating a Priority Ranking for each element. See an example on the following page.

XXX Elementary School **date**

Relative Priority Rating of Tier 1 Screening Deficiencies - Structural Items

Ref Appendix 4 of ASD Seismic Evaluation & Retrofit Guide **(0-5)** **(1-5)** **(1-4)**

Area	Checklist	Item	Deficiency	Prevalence	Threat	Priority Rating
UNGROUPED / MISC						
Structural - 1964 Building	xx.xx	22 - xxxx	5	5	4	100
Structural - 1964 Building	xx.xx	24 - xxxx	4	2	3	24
Structural - 1964 Building	xx.xx	25 - xxxx	5	1	4	20
Structural - 1964 Building	xx.xx	26 - xxxx	3	1	1	3
Structural - 1983 Addition	xx.xx	28 - xxxx	0	4	2	0
REROOFING PROJECT (FROM ABOVE ONLY)						
Structural - 1983 Addition	xx.xx	30 - xxxx	5	3	4	60
Structural - 1983 Addition	xx.xx	27 - xxxx	4	1	4	16
Structural - 1983 Addition	xx.xx	31 - xxxx	5	1	2	10
RESIDING PROJECT (FROM EXTERIOR ONLY)						
Structural - 1983 Addition	xx.xx	29 - xxxx	2	1	4	8
Structural - 1964 Building	xx.xx	23 - xxxx	1	2	3	6

Appendix 5 – Nonstructural Deficiency Priority Ranking

The Priority Ranking is a way to help determine the order in which deficiencies should be addressed. All elements with a rating above zero should be addressed, but this will allow the retrofit to be prioritized. Nonstructural deficiencies should be rated in the following three categories: degree of deficiency, prevalence, and degree of threat.

Degree of Deficiency

The percent of nonconformance should be taken into consideration when prioritizing the deficiencies. Anything considered "code deficient" should be ranked a 5. Use the following scale to rate the degree of deficiency.

0 – Elements connected and connection appears to be adequate for seismic and gravity loads.
2 – Element connected, but connection is deficient.
5 – Elements not connected to the structure to resist seismic loads.

Prevalence

It is important to recognize how many of this element is in the building. Use the following five-point scale to rate the prevalence of all deficient items.

1 – One piece of equipment, or one location, is deficient.
2 – Two pieces of equipment or locations are deficient.
3 – Three pieces of equipment or locations are deficient.
4 – Four pieces of equipment or locations are deficient.
5 – More than four pieces of equipment or locations are deficient.

Degree of Threat

Allowing for engineering judgment, the degree of threat is for including what would happen should this member fail. The threat or hazard to the occupants of the building should this element fail should be rated on the following four-point scale.

1 – The problem is not critical and will not create a falling hazard or impede egress.
2 – The problem will create a minor falling hazard but will not impeded egress nearby.
4 – The problem will create major problems and/or will impede egress from the building.

By taking the product of the three categories above (deficiency X prevalence X threat), each noncompliant item will be rated on a scale of 0 to 100, creating a Priority Ranking for each element. See an example on the following page.

XXX Elementary School **date**

Relative Priority Rating of Tier 1 Screening Deficiencies - Non-Structural Items

Ref Appendix 5 of ASD Seismic Evaluation & Retrofit Guide **(0,2,5)** **(1-5)** **(1,2,4)**

Area	Checklist	Item	Deficiency	Prevalence	Threat	Priority Rating
UNGROUPED / MISC / MAINTENANCE						
Non-Structural - All Sections	16.17	24 - EDGE SUPPORT	5	5	4	100
Non-Structural - All Sections	16.17	53 - TALL NARROW CONTENTS	5	2	4	40
Non-Structural - All Sections	16.17	54 - FALL PRONE CONTENTS	2	4	4	32
Non-Structural - All Sections	16.17	5 - SPRINKLER CEILING CLEARANCE	5	1	2	10
Non-Structural - All Sections	16.17	28 - LENS COVERS	2	2	2	8
Non-Structural - All Sections	16.17	25 - SEISMIC JOINTS	0	1	1	0
BOILER REPLACEMENT PROJECT						
Non-Structural - All Sections	16.17	8 - HAZARDOUS MATERIAL STORAGE	5	3	4	60
Non-Structural - All Sections	16.17	11 - FLEXIBLE COUPLINGS	5	2	1	10
Non-Structural - All Sections	16.17	67 - FLEXIBLE COUPLINGS	2	5	1	10
Non-Structural - All Sections	16.17	2 - FLEXIBLE COUPLINGS	5	1	1	5

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Capitol Planning and Construction (CP&C)

ASCE 41 – Tier 1 Evaluation

September 2021

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1 INTRODUCTION

1.1 BACKGROUND

At the request of the Anchorage School District (ASD), PND Engineers, Inc. (PND) completed American Society of Civil Engineers (ASCE) 41 Tier 1 Seismic evaluations of certain ASD-owned buildings. Tier 1 evaluations were completed to screen buildings for potential deficiencies in each building's ability to resist the forces induced during a seismic event. PND completed the evaluations in accordance with ASD's Publication *Seismic Evaluation and Retrofit: Guides for Existing ASD Schools* (2021) and American Society of Civil Engineers and Structural Engineering Institute (ASCE/SEI) standard *ASCE/SEI 41-17 Seismic Evaluation and Retrofit of Existing Buildings* (ASCE 41-17).

Structural Seismic Evaluations include:

- Review of existing record building documents.
- On-site inspection of each building following ASCE 41-17 Tier 1 checklists for both structural and non-structural components.
- Completion of ASCE 41-17 Tier 1 checklists for both structural (S) and non-structural (NS) components.

This report flags items that were found to be potentially deficient per the Tier 1 analysis procedures and by engineering judgement. The scope of all investigations is limited to engineering judgement of a Tier 1 evaluation. No detailed Tier 2 or 3 evaluations were performed as part of the scope of this project, and no retrofits beyond conceptual retrofit narratives are provided.

1.2 METHODOLOGY FOR SEISMIC EVALUATION

The methods used for this evaluation follow the American Society of Civil Engineers and Structural Engineering Institute (ASCE/SEI) standard *ASCE/SEI 41-17 Seismic Evaluation and Retrofit of Existing Buildings*. This standard is accepted nationwide as a tool for determining the expected level of performance for existing buildings during a seismic event. ASCE 41-17 outlines evaluation procedures for both the seismic force resisting systems and nonstructural components.

A seismic force resisting system, also called a lateral force resisting system (LFRS), is a system that uses vertical elements (frames, shear walls, etc.) to transfer lateral forces (wind, seismic loads, etc.) to the building foundation.

Non-structural (NS) components are items such as mechanical systems, lights, electrical fixtures, and architectural features. NS components do not contribute to the stability of the building as a whole: however, these items do have mass and will develop seismic forces during seismic event. As a result of

these developed seismic forces, NS items can then fall, swing, or break, which may be hazardous. Therefore, their evaluation is also required as part of a Tier 1 evaluation in accordance with ASCE.

The procedures presented in ASCE 41-17 allow engineers to identify problem areas quickly through generalized conservative checks. As deficiencies are identified, a more refined check can be triggered, elevating the Tier level of the evaluation. Evaluation levels range from Tier 1: generalized, globalized, and conservative, to Tier 3: specific, global, and precise. Tier 1 is a screening tool used to determine if, or where, a building may have deficiencies. As the Tier increases, analysis becomes more thorough and may remain global, or become more specific to a deficiency found in the previous screening process. A brief overview of each level of analysis is given below:

- Tier 1: ASCE 41-17 defines Tier 1 as "completion of checklists of evaluation statements that identify potential deficiencies in a building based on performance of similar buildings in the past". The checklists consist of common design practices that were once standard, but are now known to result in deficiencies in a building's performance during a seismic event. Each checklist contains statements that are marked as: "Compliant", "Non-Compliant", "Not Applicable", and "Unknown". These checklists involve quick check calculations that look at the broad picture of the building for fast evaluations. Items marked as Non-Compliant are not necessarily deficient: Non-Compliant status means that there is a need for further evaluation in additional Tiers. Not Applicable is applied to checklist statements that do not specifically apply to a particular structure. Unknown is relevant when a checklist criterion related to the structure cannot be determined by drawings, on-site inspection, or engineering judgement. Per Anchorage School District requirements, Unknown elements are classified as Non-Compliant, and a reason why the item was flagged as Unknown must be provided.
- Tier 2: ASCE 41-17 defines Tier 2 as "an approach applicable to certain types of buildings and performance objectives based on specific evaluation of potential deficiencies that may require mitigation. Analysis and response of the entire building may not be required". This may involve examining at the building as a whole, or focusing on deficiencies found in the Tier 1 screening. For a full building evaluation, a simplified computer model of the current building is often developed and then compared with seismic force and displacement criteria dictated by ASCE 41-17. For a component-level evaluation, a smaller-scale, more detailed analysis that focuses only on the identified deficiency areas is provided.
- Tier 3: ASCE 41-17 defines Tier 3 as "an approach to evaluation in which complete analysis of the response of the building to seismic hazards is performed implicitly or explicitly recognizing non-linear response". This is the highest level of evaluation that may be performed under ASCE/SEI 41-17. This level of evaluation requires detailed computer modeling and analysis of the entire building. The more precise computer finite element modeling (FEM) required to provide a Tier 3 analysis allows this analysis to be less conservative than a Tier 2 or Tier 1. Less conservative results may mean that items identified as deficient under Tier 1 or 2 may be found to be satisfactory. Very complex or highly irregular buildings may automatically trigger this level of analysis, as ASCE 41-17 limits the applicability of Tier 1 and Tier 2 analysis.

The ASD has determined the scope of work for this report to be the ASCE 41-17 Tier 1 evaluation. This Tier 1 evaluation includes non-structural item checklists. Per ASCE 41-17, a "Non-Compliant" element found during a Tier 1 investigation does not indicate deficiency, but will trigger a higher level of analysis. PND performed a scoring of the school in accordance with ASD *Seismic Evaluation and Retrofit Guide v7.3* (ASD

Standard). This scoring is intended to act as and aid to ASD in prioritizing repairs. A conceptual-level narrative of possible repairs of deficient items is included as a part of this report. However, cost estimates for these repairs are not included with this report.

1.3 Seismic Conditions

The site-specific design short-period and one-second period spectral ground accelerations for the Maximum Considered Earthquake (MCE) are summarized with the design criteria. The design accelerations in the Anchorage Bowl area classify this region as "high" seismicity. Accelerations are only one tool in determining the risk associated to a building; the soil, or site classification, is another factor in determining the seismicity of a site. Site Class is a description of soil properties at a specific site. This ranges from Site Class A, hard rock, to Site Class F, a very soft clay soil profile. Soil-structure interaction effects can be significant, but interactions between the soil and structure can be very difficult to analyze, so conservative soil properties are provided by code to simplify this interaction.

1.4 Performance Levels

The ASCE 41-17 standard relies on *Basic Performance Objectives for Existing Buildings* (BPOE). This sets a standard for performance for the building. Using this standard, a performance level can be determined. In this performance objective, the desired level of performance is evaluated for a particular magnitude of earthquake to determine if the building performance is adequate. The ASD further develops these guidelines to better assess the building performance, and specifically tailor performance to the ASD target objective.

Three magnitudes of earthquake are considered:

- BSE-2E is an earthquake with an expected probability of return of 5% in 50 years. This would result in an earthquake with a magnitude of roughly M8. After an earthquake of this magnitude, major roadway damage, loss of utilities, and moderate building damage are expected.
- BSE-1E is a smaller earthquake with an expected probability of return of 20% in 50 years. This would result in an earthquake of a magnitude of approximately M6. This level of earthquake is not uncommon in the Anchorage bowl. Although it would likely cause alarm and cracks in shear walls and non-structural components, it is not likely for this magnitude of earthquake to cause significant damage to structures, roads, or utilities.
- BSE-1N is a magnitude of earthquake that is two thirds of the maximum considered earthquake. This is the standard level used for new designs. This would result in an approximate M7 magnitude of earthquake. After an earthquake of this magnitude, it would be expected to see roadway damage, ground cracking, and damage to houses, utilities, and other buildings.

The target level of performance chosen by the ASD is Damage Control (S-2) at a BSE-1N level seismic event, or a rating 125% (Risk Category III). However, all "quick checks" and evaluations are to be done for a BSE-2E, limited safety performance (S-4), or rating 60%, per ASD standard. Safety performance levels are defined as follows:

- *Immediate Occupancy (S-1)* – The structure will retain the pre-earthquake strength and stiffness and can be utilized immediately. Few to no injuries should occur to persons within the structure due to building failure.

- *Damage Control (S-2)* – Some damage will occur to the building, with small permanent drift. Damage should be economical to repair. The building is capable of being occupied following shaking, but damage should be addressed as soon as feasible.

- *Life Safety (S-3)* – Moderate damage will be present in the building, with some residual strength left in the elements. Minor permanent drift will be present. The building may be beyond economical repair. Injuries due to structural failure should be few.

- *Limited Safety (S-4)* – Moderate to severe damage. The building will have permanent drift and will be beyond economical repair and should not be reused following an earthquake. Damage to the structure may cause injuries or obstacles to evacuation, but these should be minor.

- *Collapse Prevention (S-5)* – Severe damage is present throughout the structure. Little residual strength and stiffness remains, but load-bearing columns and walls should function. Large permanent drifts exist in the structure and exits may be blocked. The building is near collapse. This is a hazard to human safety and will not be reusable. Risk of injury due to structural damage is high.

To evaluate the structures for this level of performance, the collapse prevention checklists were used, and modification factors were interpolated to reflect the S-4 safety level as required. Ranking is then determined at BSE-2E accelerations, with a S-4 modification factor. Per ASCE 41-17, a BSE-2E ranking can be converted to a BSE-1N event by multiplying by a ratio of the BSE-1N design acceleration to BSE-2E design acceleration. A BSE-2E S-4 converted to a BSE-1N ranks approximately 80%, ranking overall between limited safety, S-4 (60%), and life safety, S-3 (100%).

1.5 Non-Structural Evaluations

Nonstructural components are evaluated for two different performance levels. The first is hazard reduced (N-D) using a BSE-2E level seismic event. Hazards reduced means "non-structural elements are damaged and potentially create falling hazards, but high-hazard nonstructural components are secured to prevent falling into areas of public assembly". The second performance level is position retention (N-B) using a BSE-1N level seismic event. Position retention means "non-structural components might be damaged to the extent that they cannot immediately function but are secured in place so that damage is avoided".

2 BUILDING DESCRIPTION

2.1 GENERAL

1976 Original Building

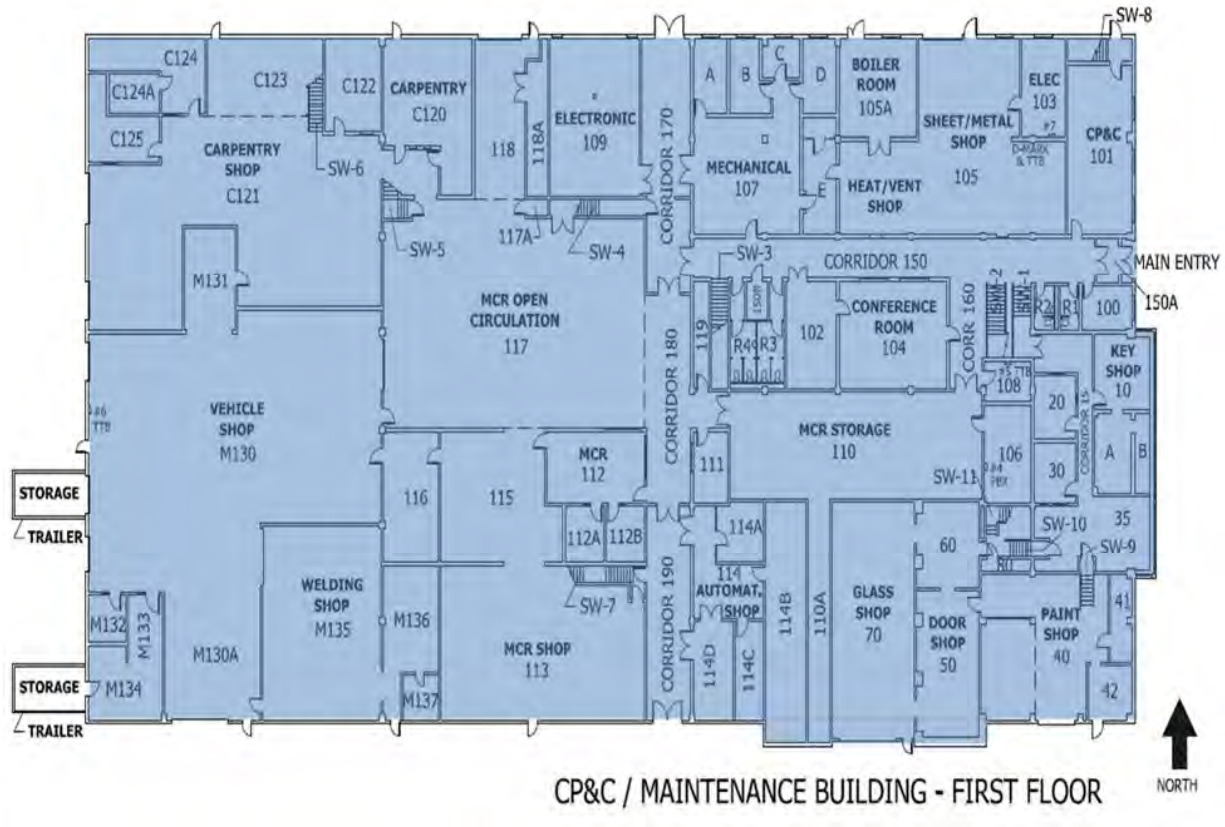


Figure 2-1 CP&C Frist Floor Configurations

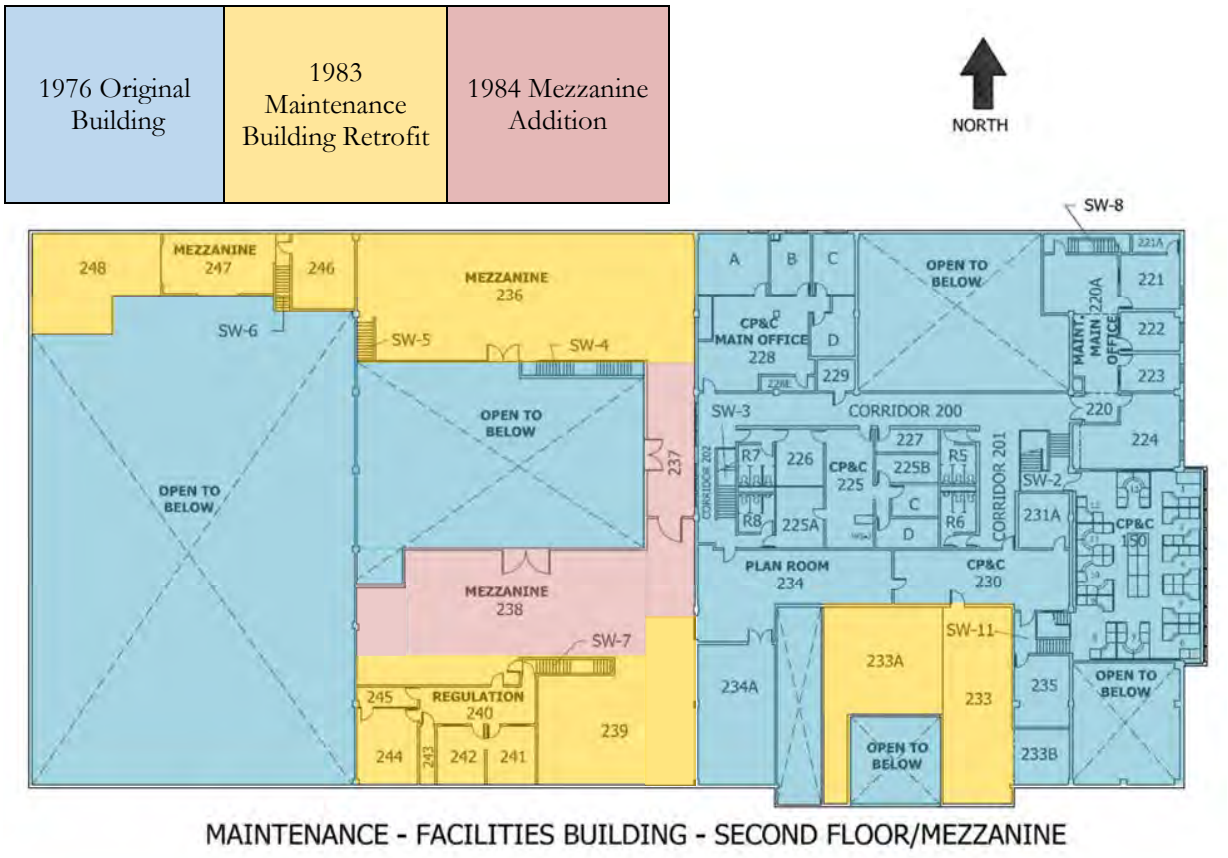


Figure 2-2 CP&C Second Floor and Mezzanine

CP&C is a two-story building constructed in 1976. The design configuration used for CP&C was originally a brewery that was purchased in 1983 by the Anchorage School District. In 1983 mezzanines were added on the second floor to the large warehouse area and to infill a two-story opening, both at the west end of the building. In 1984, a mezzanine attaching the north and south warehouse mezzanines was added. Additional improvements include, a 2001 boiler room renovation and maintenance shop improvement, and 2006 HVAC systems retrofit that also included the addition of roof guardrails. The site visit showed that the 2001 maintenance improvement was either not built or removed.

2.2 AS-BUILT DOCUMENTATION

The Anchorage School District provided "as-built" documentation for review of the existing conditions for the building. From those drawings, PND performed a detailed review of drawings that pertained to the original structure and structural modifications that were made after the original construction. The following is a list of drawings reviewed by PND:

- 1975 Prinz Brau As-Builts
- 1983 Maintenance Building Retrofit
- 1984 Mezzanine Addition
- 2001 Boiler Room Renovation
- 2001 Maintenance Shop Improvement (Not Found)
- 2006 Roof Guardrails
- 2006 HVAC Upgrades

Of these drawings, the 1975, 1983 and 1984 drawings were found to be most complete and relevant. The 1975 drawings were used as the primary source of reference for existing building systems, supplemented with 1983, 1984, and 2006 drawings. It should be noted that drawings were scanned from original documents and the quality of the original documents directly affected the team's ability to read or interpret those documents. PND assumed the building was built to the specifications referenced on the plans.

2.3 ORIGINAL DESIGN CRITERIA

The following table includes both current and original design criteria. Original design criteria are based on provided record drawings.

Table 1-1 Design Criteria

Building Section	Original Building Code	Roof Snow	Wind	Seismic
1975 Original Building	1973 UBC	40 psf	q_s = 20 psf to 30' above grade; qs = 25 psf above 30'	Zone 3, 1973 UBC
1983 Maintenance Building Retrofit	1982 UBC	40 psf	q_s = 30 psf	Zone 4, 1982 UBC
1984 Mezzanine Addition	1982 UBC	40 psf	qs = 30 psf	Zone 4, 1982 UBC
Current Code	2018 IBC (ASCE 7-16) Risk Cat. III	40 psf min plus drifting Is = 1.10	160 mph, Exp. B (LRFD), qz (ASD) = 22.8psf * 0.6 = 13.7 psf	S_s= 1.50g S_1= 0.677g SDC=D, I_e =1.25 R=5, V=0.25w

2.4 Building Type

The original 1975 structure consists of several lateral force resisting systems (LFRS) and gravity systems. Grade elevation is defined in drawings, and in this report at 100'– 00". Low roof level (127' -1") is a flexible metal deck diaphragm and at the west end of the building the roof is supported vertically by steel beams and columns, and laterally by two-story precast concrete panels. At the west end of the building the low roof is supported vertically by steel beams and columns, and laterally along the exterior by precast concrete panels.

At rooms 233 and 233A, a high roof extends up (144' -7") above the low roof. Steel brace frames are on all four sides, from high roof to top of slab (TOS) of the third floor (133' -0"). "Third Floor" is used to describe this elevation but appears to be a partial mezzanine level that is not in service. Another level of brace frames continues from TOS third floor elevation through the slab at elevation (127' -7"), to the bottom of slab at (127' -1") low roof, to a mezzanine level at (125 -10"). This mezzanine level between the third and second floors also does not appear to be in service. Brace frames below low roof elevation have composite columns and beams incased in concrete.

The second floor (113' -0") at the east end of the building is a rigid concrete slab that varies in thickness from 7 inches to 5 ½ inches. The concrete floors here are supported by steel composite beams encased in concrete, on steel composite columns encased in concrete. At rooms 233 and 233A, the LFRS is composed of steel brace frames extending to grade (100' -00") on three sides. The fourth side along these rooms at grid 4.9 are steel moment frames extending from the second floor to grade. A flexible wood diaphragm was also added during the 1983 addition at the second floor to infill openings that existed on the second floor at Rooms 233 and 233A. Concrete masonry unit (CMU) bearing, and shear walls are also used sporadically in the eastern portion of the building extending from grade to low roof; however, most CMU walls are partition walls and not part of the LFRS. At the west end of the building, several mezzanine levels were added during the 1983 and 1984 additions with flexible wood diaphragms and light framed (wood) bearing walls sheathed with structurally rated wood panels along the interior and attached to precast concrete walls along the exterior.

The first floor (100' -00") is concrete slab on grade, with portions bearing on interior CMU walls sitting on a 10-inch stem wall extending 5 feet below grade to strip footings along exterior walls. Precast walls all end at grade and are also sitting on stem walls on strip footings. Interior structural steel columns end at the first floor on pilasters that extend 1 foot below finish floor (FF) to box footings. Exterior steel columns are also sitting on concrete pilasters that extend down the base of stem wall and are sitting on box footings that are monolithically cast into the strip footing.

A basement "split floor" slab (95' -1 ¾") extends up to grade and ties into the stem wall strip footing.

2.5 Site Visit

PND Engineers performed its on-site evaluation of CP&C on September 8th, 2021 at 1301 Labar Street in Anchorage. The purpose of the site evaluation was to field verify "as-built" representations of the building's construction. PND also used this visit to confirm members or details that were either not identified on the plans or, due to the quality of original documents, were incomplete or illegible. This visit was necessary for completion of Tier 1 checklists.

The additional focus of the September 8th inspection was to evaluate NS components for Tier 1 checklists, as these components will often change throughout the life of the structure. Site visits only provide a snapshot of current NS components and their status.

2.6 GEOTECHNICAL DATA

ASD did not include geotechnical data for our reviewer. However, per ASCE7-16 20.1: "where soil properties are not known in sufficient detail to determine the site class, Site Class D, subject to requirements of 11.4.4, shall be used unless Authority Having Jurisdiction or geotechnical data determine that Site class E or F soils are present at the site". As geotechnical data is limited, a soil classification of D was used. This is consistent with adjacent building designs, which also used site class D.

According to the Municipality of Anchorage (MOA) Geographic Data Information Center Seismic Susceptibility Map, CP&C is in an area of Moderate to Moderate-Low ground failure susceptibly (APPENDIX D). Based on this information, liquefaction probability is not high, but further study would need to be performed to verify this.

2.7 REFERENCES

- ASCE/SEI 7-16 Minimum Design Loads and Associated Criteria for Buildings and Other Structures
- ASCE/SEI 41-17: Seismic Evaluation and Retrofit of Existing Buildings
- International Building Code 2018
- Seismic Evaluation and Retrofit Guide for Existing Anchorage School District Buildings v7.3

3 SEISMIC BUILDING EVALUATION RESULTS

In accordance with ASD standards all structural elements are considered High Level of Seismicity, Earthquake Hazard BSE-2E, default material properties from ASCE 41-17 when materials are not specified on drawings. The school will have a *Basic Performance Objective of Existing Building* (BPOE) of Risk Category III, Limited safety (S-4). Quick calculations were performed using a S_{xs} and S_{1x}. S_a and M_s values will be interpolated between Life Safety and Collapse Prevention for Limited Safety using the BSE-2E seismic event. Scoring will be done based on the BSE-2E event and then modified to represent scoring of the structure under a BSE-1N event. Only the collapse prevention checklist will be used during Tier 1 screenings.

According to ACSE 41-17 Table 3-1, the following building system classifications were identified:

- A building with light framed (wood) bearing walls sheathed with structural rated panels attached to a flexible diaphragm, greater than 5000 ft^2, and used for commercial or industrial purposes is defined as a W2. W2 (Table 17-06) checklists were used for portions of the structure that met this criterion: mezzanines at the west end of the building and at the second floor for rooms 233 and 233A.

- A building with steel moment frames attached to a rigid concrete diaphragm are classified as a S1, and steel moment frames attached to a flexible wood diaphragm are S1a. The S1 and S1a (Table 17-08) checklists were used for portions of the structure that met this definition. This LFRS was found at Rooms 233 and 233A, east wall, from grade to the second floor.

- A building with braced frames to develop seismic forces and a flexible rigid concrete deck diaphragm is classified as an S2. S2 and S2a (Table 17-10) checklists were used for portions of the structure that met this classification: Rooms 233 and 233A from grade to high roof at their north, south, and west walls, and from second floor to high roof at the west wall.

- A building with tilt up precast concrete shear walls attached to a flexible metal deck diaphragm is classified as a PC1, and precast concrete shear walls attached to a rigid concrete floor is PC1a. PC1 and PC1a (Table 17-28) checklists were used for portions of the structure that met this classification: Roofs supported by the exterior walls.

- A CMU shear wall system with a rigid diaphragm is defined as a RM1. RM1 and RM2 (Table 17-34) checklists were used for portions of the structure that met this classification: room portions of the east end of the building from grade at the first floor to low roof.

Due to the variation of lateral force resisting systems across the building, the use of more than one of the systems per floor, and the mix of rigid and flexible diaphragms, buildings of this type cannot be properly evaluated with a Tier 1 evaluation. A higher level of analysis is automatically required per ASCE 41-17. Even though a Tier 1 evaluation does not apply, per the request of the Anchorage School District, structural checklists were filled out and elements were evaluated as completely as could be accomplished under a Tier 1 level of detail.

All non-structural components were evaluated for Hazards Reduced performance level using a BSE-2E level event and for Position Retention at a BSN-1E level event, as defined by ASD standard.

3.1 BASIC CONFIGURATION

ASCE 41-17 Table 17-1 Very Low Seismicity Checklist (APPENDIX C pp. C-1), and Table 17-2 Collapse Prevention Basic Configurations Checklist (APPENDIX C pp. C-1) were completed.

Of *Collapse Prevention Basic Configuration Checklist* (ASCE 41-17 Table 17-1 & 17-2) (16) Items, (6) items were found non-Compliant[1][2] and (1) was Unknown.[2]

3.1.1 LOAD PATH; TABLE 17-1 (01):

Due to the age of the building, quality of provided structural drawings, and modifications made to the structure over the years, a clear load path could not always be determined.

Mezzanine 247 only appears to be attached to a LFRS along the north exterior wall, and Room 248 only appears to be attached to the north and west exterior walls. Figure B-56 shows a portion of the floor diaphragm for Mezzanine 247 that has no clear connection to any vertical members of the LFRS. For wood structures, if certain aspect criteria are met, defined in National Design Specifications for Wood Construction 2018, three-sided wood diaphragms are permitted, but diaphragms attached to vertical members at only one or two sides are not permitted. Additionally, along grids 8 and 12, the mezzanine appears to be attached to CMU partitions. As-built drawings indicate these walls were detailed as partition walls, not intended as part of the LFRS, and are not attached to the roof diaphragm.

Figures B-10 through B-21 show an exterior canopy attached to Conex containers. One of the Conex boxes does appear to be attached to the structure, but with no drawings provided detailing this connection, it cannot be assumed this connection is sufficient. The canopy roof appears to be sufficiently restrained to the Conex boxes to prevent uplift, but there is no mechanism to transfer this force to the ground. The Conexes' weights might be sufficient to prevent uplift of the structure during a design event. However, lateral forces from either a seismic or wind design event again have no apparent mechanism to transfer forces to a foundation. Support elements observed under the Conex boxes are only able to reliably resist gravity loads.

RECOMMENDATION

A higher level of analysis may prove a clear load path and show existing elements are sufficient. Unfortunately, based on our field observations and engineering judgment, the mezzanine and Conex boxes do not appear to have a complete load path.

For the mezzanine, light framed walls sheathed with structural rated wood panels could be added vertically and attached to the diaphragm to provide additional lateral force resistance. A structural engineer would need to be contracted to verify that a sufficient length of wall is provided. The partition

[1] Note: Non-compliant or unknown ratings do not necessarily indicate deficiency, only that there may be a need for a higher level of analysis.
[2] See APPENDIX A table A-1 For Prioritization and Breakdown of General and Structural Checklists.

walls attached to the wood diaphragm are likely sufficient, but analysis must be done to confirm the walls have sufficient capacity.

The Conex box canopy must have its connection to the exterior wall verified and checked to ensure it has sufficient strength to transfer forces. The exterior walls must also be checked to ensure that they have sufficient capacity to take the additional load. If this connection is not sufficient, a suitable engineered connection must be provided. If the exterior walls are insufficient, a seismic gap must be provided to isolate the Conex boxes from the main structure. This isolation joint could also be used in lieu of an engineered mechanical connection. Mechanically connecting both Conex boxes to the main structure or isolating boxes from the main structure would require providing additional supports to transfer the lateral forces acting on the Conex boxes to the ground. This could be done with a variety of mechanisms, such as stem wall on footings, structurally sheathed pony walls, or using tie back or dead man anchors. The simplest solution would be to detach the Conex units from the structure, so they are seismically isolated and independent from the main building structure.

3.1.2 WALL ANCHORAGE; TABLE 17-1 (02):

Due to the wide assortment of LFRSs and the modifications to the original structure, determining anchor forces per ASCE 41-17 4.4.3.7 is difficult. However, there are anchors (APPENDIX E) that can be loaded beyond their capacities as defined by this section. In many places the addition of wood mezzanines may have corrected this problem, but there are still instances where tall 8-inch CMU walls (26+ feet) are restrained out-of-plane by anchors at 6 feet 8 inches on center (o.c.) and are insufficient per ASCE 41-17 section 4.4.3.7 “Quick Check”.

RECOMMENDATION

A higher level of analysis should be done to verify “Quick Check” deficient CMU partitions restrained by the low roof diaphragm are in fact beyond the demand/-to-capacity ratio. Furthermore, a more detailed investigation into the building’s wood diaphragm connections to both precast concrete and CMU walls should be performed, because it is unclear how these wood diaphragms transfer load to walls parallel to joists.

3.1.3 LOAD PATH; TABLE 17-2 (01):

See 3.1.1

RECOMMENDATION

See 3.1.1 Recommendation

3.1.4 ADJACENT BUILDINGS; TABLE 17-2 (02):

One of the Conex boxes is not attached to the main structure. This would fall into the criteria of an adjacent structure. Estimated height to Conex is 12’. Per 17-2 ,02, adjacent structures in a high seismicity zone must be minimum 1.5% the height of the shorter structure apart. The required separation required is approximately 2 1/8 inches. Figure B-15 indicates that the Conex is less than 2 inches from the main structure.

RECOMMENDATIONS

The Conex should either be attached to the main structure, provided the exterior wall can take the additional lateral load, or the necessary separation should be provided to isolate the two structures.

3.1.5 SOFT STORY; TABLE 17-2 (05):

Moment frames are typically much less stiff than braced frames or concrete/CMU shear walls. Engineering judgement says the moment frames at the base floor to second floor along the east wall of room 233A likely present a soft story in this line.

RECOMMENDATIONS

A higher level of analysis should be performed to ensure that soft story does not create unintended problems in the LFRS, such as transferring load to surrounding stiffer portions that then take more load than designed for. Additionally, analysis should verify whether soft story collapse is a concern is this area.

3.1.6 TORSION; TABLE 17-2 (09):

The wide assortment of LFRS in this structure, particularly ones attached to a rigid concrete floor, make it very difficult to predict the locations of center of rigidity. This is further compounded by the wide variety in the thicknesses of the concrete floors. Furthermore, as half of the structure is a two-story open floor, the center of mass would tend to be more towards the heavier and more rigid side of the building. However, wood mezzanines have been added within the open areas, which may move the center of mass closer to the middle of the building. Approximation of the centers of mass and rigidity suggests that, in the longitudinal direction, they are more than 60 feet apart. Per table 17-2/09, the estimated distance between the center of mass and the center of rigidity should be less than 20% of the building width in either plan direction, approximately 57 feet 5 inches.

RECOMMENDATIONS

A higher level of analysis should be performed to verify the exact locations of the center of mass and the center of rigidity to confirm the distance between the two and determine if a torsional irregularity exists. If irregularity is confirmed, an analysis should be done to determine what this means for load distribution in the LFRS, and it should be verified that irregularity is not increasing loads on members of the LFRS beyond that of their design capacity.

3.1.7 LIQUEFACTION; TABLE 17-2 (10):

According to the MOA hazard map, CP&C is in a Low-Moderate hazard zone (APPENDIX D). However, it is not clear what these levels mean as related to liquefaction.

RECOMMENDATIONS

Further geotechnical study should be performed to verify that liquefaction is not a concern.

3.2 ORIGINAL 1977 CONSTRUCTION, 1983 & 1984 ADDITIONS

Structural evaluations were primarily conducted based on provided as-built documents. However, some structural observations were made during the on-site visit to verify the building was built in accordance with design documents and to clarify items noted during the evaluation that were not clearly indicated in the plans.

TYPE W2 LFRS

For flexible diaphragms attached to wood shear walls, more than 5000 ft^2, and for commercial or industrial use, *Collapse Prevention Structural Checklist for Building Types W2* Table 17-06 (APPENDIX C, C-2) was used.

Of *Collapse Prevention Structural Checklist for Building Types W2* (ASCE 41-17 Table 17-06) (20) Items, (2) items were found Non-Compliant [3][4] and (2) were Unknown[4].

3.2.1 REDUNDANCY; TABLE 17-06 (01):

Shear walls lines under the mezzanine in the carpentry shop are not easily apparent in the transverse and longitudinal directions, especially as they relate to Mezzanine 247.

RECOMMENDATIONS

A more detailed investigation should be done to verify whether two or more shear walls are provided in each principal direction. If two lines are not provided in principal directions, a more detailed analysis should be done to verify if they are necessary. Should Mezzanines 246 and 248 be found to be code compliant, an engineered connection to 246 and 248 under Mezzanine 247 should be provided, or additional shear walls under Mezzanine 247 in transverse and longitudinal directions should be added.

3.2.2 WOOD SILLS; TABLE 17-06 (11):

No sill anchors could be found in record drawings. It is not likely they are not present, but this could neither be confirmed nor denied because the walls are enclosed with sheathing or drywall.

RECOMMENDATIONS

A more detailed investigation involving destructive demo should be completed to verify whether or not sill anchors are provided to connect the walls to the slab or other foundation elements.

3.2.3 WOOD SILL BOLTS; TABLE 17-06 (13):

No sill anchors could be found in record drawings. It is not likely they are not present, but this could neither be confirmed nor denied because the walls are enclosed with sheathing or drywall.

[3] Note: Non-compliant or unknown ratings do not necessarily indicate deficiency, only that there may be a need for a higher level of analysis.
[4] See APPENDIX A table A-1 For Prioritization and Breakdown of General and Structural Checklists.

RECOMMENDATIONS

A more detailed investigation involving destructive demo should be completed to verify whether or not sill anchors are provided to connect the walls to the slab or other foundation elements.

3.2.4 DIAPHRAGM CONTINUITY; TABLE 17-06 (14):

Figure B-56 shows Mezzanine 247 as a split level. Therefore, diaphragm continuity is broken.

RECOMMENDATIONS

Engineered connection between Mezzanine 246 and 248 should be provided.

TYPE S1 & S1a LFRS

For flexible diaphragms attached to steel brace frames, *Collapse Prevention Structural Checklist for Building Types S1 and S1a* Table 17-08 (APPENDIX C, C-3) was used. However, due to the mixed systems with rigid diaphragms, a building of this type does not fit the criteria for a Tier 1 inspection. Because of this, the single line of moment frames consists of field manufactured sections instead of standard rolled sections, which are also composite (use both steel and concrete to resist forces). Plans are not clear on how these moment frames were assembled. Making informed comments on the behavior of these moment frames would be beyond the realm of reasonable assumptions. Due to the sheer size of the members, it is likely these moment frames are overdesigned, but without a detailed finite analysis of not just the frames but the systems surrounding them, no definite conclusions can be drawn.

Of *Collapse Prevention Structural Checklist for Building Types S1 and S1a* (ASCE 41-17 Table 17-08) (20) Items, (11) items were found to be something that reasonable assumptions could be made about. Of these eleven items one was Non-Compliant[5][6]. However, redundancy being non-compliant is likely irrelevant because them moment frame is only small part of a large system, and the moment frame itself is likely designed to be a redundancy.

3.2.5 REDUNDANCY; TABLE 17-08 (01):

As this building only has one line of moment frames, this ASCE 41-17 guideline is not met. However, this is probably trivial because the moment frames here make up a very small part of the LFRS and are likely overdesigned for their singular function with redundancy built into them.

RECOMMENDATIONS

This building does not fall under the ASCE 41-17 criterion for a Tier 1 evaluation. This means that per this standard, a higher level of analysis is immediately required. Engineering judgement says that because

[5] See APPENDIX A table A-1 For Prioritization and Breakdown of General and Structural Checklists.
[6] Note: Non-compliant or unknown ratings do not necessarily indicate deficiency, only that there may be a need for a higher level of analysis.

moment frames members are so large and composite, a higher level of analysis will reveal redundancy is not required.

TYPE S2 & S2a LFRS

For flexible diaphragms attached to steel brace frames, *Collapse Prevention Structural Checklist for Building Types S2 and S2a* Table 17-10 (APPENDIX C, C-4) was used.

Of *Collapse Prevention Structural Checklist for Building Types S2 and S2a* (ASCE 41-17 Table 17-10) (21) Items, (5) items were found Non-Compliant[7][8].

3.2.6 COLUMN AXIAL STRESS CHECK; TABLE 17-10 (02):

PND performed ASCE 41-17 4.4.3.6 (APPENDIX E) checks on (2) brace frame columns, based on provided as-builts.[9] Since the building does not meet the criteria of a Tier 1 analysis, and because of the wide array of LFRS, forces were distributed to the various LFRS using flexible diaphragm tributary area assumptions. The braced frame (BF) only takes loads of the immediately adjacent tower, and the majority of the load throughout the building goes to the much more rigid CMU and precast concrete shear walls. Actual forces will vary in a more detailed analysis, but the purpose of this check was only to provide a "ballpark" feel for the applied loads. Of the two columns checked, one was found to be Non-Compliant: C7.

RECOMMENDATIONS

This building does not fall under the ASCE 41-17 criterion for a Tier 1 evaluation. This means that per this standard, a higher level of analysis is immediately required. Engineering judgement says that because a BF is much less rigid than the surrounding shear walls, and that the ASCE 41-17 "Quick Check" shows governing columns to be close, a higher level of analysis will likely show that the member is well within capacity.

3.2.7 CONNECTION STRENGTH; TABLE 17-10 (07):

PND performed AISC 360 (APPENDIX E) checks on (5) brace frame gusset plates[10], based on provided as-builts. Of these (5) gusset, (1) failed under connection buckling capacity. APPENDIX E shows all HSS6x6 are attached to gussets in a way that failure does not occur at the connection per modern code. However, HSS6x6x1/2 is sufficiently welded, but the Whitmore section, the section shown through laboratory testing that tension and compression forces will act upon, is not sufficient to resist the buckling forces in the plate of the attached brace.

[7] See APPENDIX A table A-1 For Prioritization and Breakdown of General and Structural Checklists.
[8] Note: Non-compliant or unknown ratings do not necessarily indicate deficiency, only that there may be a need for a higher level of analysis.
[9] Note: Engineering judgement was used to determine which columns required Column Axial Stress Checks, not all columns were checked.
[10] Note: Engineering judgement was used to determine which gusset plates required yielding and buckling checks, not all gussets were checked.

RECOMMENDATIONS

Seismic codes changed drastically after the 1994 Northridge earthquake. Codes written prior to Northridge did not have the ductility requirements, emphasizing on strong column weak beam, and the connection detailing required that failure not occur at the connections. As this building was built prior to these code changes, it is not surprising that the members can be shown to meet the approximate demand needs but fail all other modern seismic code requirements. As this building does not meet the required criterion for a Tier 1 evaluation, a higher level of analysis is immediately triggered. The only way to bring braced frames up to modern seismic code requirements would be to require an almost complete retrofit of the braced frames. A higher level of analysis may show that building systems are well above demand requirements, and the need to bring connections up to modern seismic standards may not necessary if upgrades are not triggered by future building upgrades or changes in occupancy per the clauses of the existing building code.

3.2.8 CONNECTION STRENGTH; TABLE 17-10 (12):

PND performed AISC 360 (APPENDIX E) checks on (5) brace frame gusset plates[11], based on provided as-builts. Of these (5) gusset plates, (4) failed under connection yield capacity. APPENDIX E shows HSS6x6x3/16 is attached to its gusset in a way that failure does not occur at the connection per modern code. However, HSS6x6X1/4 is sufficiently welded, but the Whitmore section, the section shown through laboratory testing that tension and compression forces will act upon, is not sufficient to develop the yield strength of the attached brace. The HSS6x6X1/2 is not sufficiently welded, and the Whitmore section is not sufficient to develop the yield strength of the attached brace. Bolted connections at angle braces were also shown to be insufficient in both Whitmore yielding and the shear of bolts in the bolted connection.

RECOMMENDATIONS

As this building was built pre-Northridge, it is not surprising that the members can be shown to meet the approximate demand needs but fail all other modern seismic code requirements. As this building does not meet the required criterion for a Tier 1 evaluation, a higher level of analysis is immediately triggered. The only way to bring braced frames up to modern seismic code requirements would be to require an almost complete retrofit of the braced frames. A higher level of analysis may show that building systems are well above demand requirements, and the need to bring connections up to modern seismic standards may not necessary if upgrades are not triggered by future building upgrades or changes in occupancy per the clauses of the existing building code.

3.2.9 COMPACT MEMBERS; TABLE 17-10 (13):

PND performed AISC 341 (APPENDIX E) checks on (5) braces[12], based on provided as-builts. Of the five braces, three failed checks for moderate ductility: HSS6x6x3/16 and both the double angle braces.

[11] Note: Engineering judgement was used to determine which gusset plates required yielding and buckling checks, not all gussets were checked.
[12] Note: Engineering judgement was used to determine which members required ductility checks, not all members were checked.

RECOMMENDATIONS

As this building was built pre-Northridge it is not surprising that the members can be shown to meet the approximate demand needs but fail all other modern seismic code requirements. As this building does not meet the required criterion for a Tier 1 evaluation, a higher level of analysis is immediately triggered. The only way to bring braced frames up to modern seismic code requirements would be to require an almost complete retrofit of the braced frames. A higher level of analysis may show that building systems are well above demand requirements, and the need to bring connections up to modern seismic standards may not necessary if upgrades are not triggered by future building upgrades or changes in occupancy per the clauses of the existing building code.

3.2.10 CHEVERON BRACING; TABLE 17-10 (14):

PND performed AISC 360 (APPENDIX E) checks on (2) brace beams[13]. As beam sizes remain consistent from floor to floor and checks are based on brace capacity, not demand, these two beams are likely representative of all beams in braced frames. Both beams failed under combined brace buckling and yielding.

RECOMMENDATIONS

As this building was built pre-Northridge it is not surprising that the members can be shown to meet the approximate demand needs but fail all other modern seismic code requirements. As this building does not meet the required criterion for a Tier 1 evaluation, a higher level of analysis is immediately triggered. The only way to bring braced frames up to modern seismic code requirements would be to require an almost complete retrofit of the braced frames. A higher level of analysis may show that building systems are well above demand requirements, and the need to bring connections up to modern seismic standards may not necessary if upgrades are not triggered by future building upgrades or changes in occupancy per the clauses of the existing building code.

TYPE PC1 & PC1a LFRS

For flexible or rigid diaphragms attached to precast concrete shear walls, *Collapse Prevention Structural Checklist for Building Types PC1 and PC1a* Table 17-28 (APPENDIX C, C-5) was used.

Of *Collapse Prevention Structural Checklist for Building Types PC1 and PC1a* (ASCE 41-17 Table 17-28) (21) Items, (3) items were found Non-Compliant[14][15].

[13] Note: Engineering judgement was used to determine which beams would require checks, not all beams were checked
[14] See APPENDIX A table A-1 For Prioritization and Breakdown of General and Structural Checklists.
[15] Note: Non-compliant or unknown ratings do not necessarily indicate deficiency, only that there may be a need for a higher level of analysis.

3.2.11 WOOD LEDGERS; TABLE 17-28 (07):

Wood ledgers added in 1983 and 1984 do not have clearly detailed connections to the precast concrete walls parallel to the wood joists. It seems reasonable to assume the same connection that was used perpendicular to the joist would also have been used. Because a detail is not provided, PND also assumes blocking was not provided between the parallel joist and wall. Without this blocking, cross grain bending would be induced.

RECOMMENDATION

Joist bays parallel and adjacent to precast walls should be checked for blocking between joist and wall and, if not present, blocking should be added. Furthermore, a more detailed investigation into the building's wood diaphragm connections to both precast concrete and CMU walls should be performed, because it is unclear how these wood diaphragms transfer load to walls parallel to joists.

3.2.12 TRANSFER TO SHEAR WALLS; TABLE 17-28 (08):

This item was flagged not because wood mezzanine diaphragms are not believed to be attached to walls, but because connections to wood diaphragms are not called out in plans.

RECOMMENDATION

A more detailed investigation into the building's wood diaphragm connections to precast walls should be performed and specific care should be taken to ensure precast walls can take additional shear loading without unforeseen consequences.

TYPE RM1 & RM2 LFRS

For flexible or rigid diaphragms attached to CMU shear walls, *Collapse Prevention Structural Checklist for Building Types RM1 and RM2* Table 17-34 (APPENDIX C, C-6) was used.

Of *Collapse Prevention Structural Checklist for Building Types RM1 and RM2* (ASCE 41-17 Table 17-34) (20) Items, (4) items were found Non-Compliant[16].

3.2.13 SHEAR STRESS CHECK; TABLE 17-34 (02):

PND performed ASCE 41-17 4.4.3.3 (APPENDIX E) checks on (2) walls[17], based on provided as-builts. Because the building does not meet the criteria of a Tier 1 evaluation, and due to the wide array of LFRS, forces were distributed to the various LFRS using flexible diaphragm tributary area assumptions. The BF only takes loads of the immediately adjacent tower, and the majority of the load throughout the building goes to the much more rigid CMU and precast concrete shear walls. Actual forces will vary: the purpose

[16] Note: Non-compliant or unknown ratings do not necessarily indicate deficiency, only that there may be a need for a higher level of analysis.
[17] Note: Engineering judgement was used to determine which walls required strength checks, not all walls were checked.

of this check was only to provide a "ballpark" feel for the applied loads. Of the two walls analyzed, both failed the checks.

RECOMMENDATIONS

Based on engineering judgement, a flexible diaphragm assumption of load distribution might be overly conservative. A more detailed analysis employing a rigid diaphragm may redistribute the loads in a way that decreases the CMU wall loads and increases the precast wall loads. PC1 and PC1a checklist "quick checks" (APPENDIX E) showed the precast walls to be significantly under capacity. 7 ½-inch precast walls will be more rigid than 8-inch CMU walls grouted 32 inches o.c. of the same height. As provided drawings indicate that all CMU shear walls are attached to a rigid diaphragm, exterior precast walls likely take more load than the flexible diaphragm assumption applies. As the exterior precast walls have a good deal of capacity remaining in them, they would be able to take the additional load without complications. By taking this additional load, the precast walls would relieve some load from the CMU walls, likely bringing loading into an acceptable capacity for the CMU as well.

3.2.14 WALL ANCHORAGE; TABLE 17-34 (05):

Due to the wide assortment of LFRS and the modifications to the original structure, determining anchor forces per ASCE 41-17 4.4.3.7 is difficult. However, there are anchors (APPENDIX E) that are beyond their bearing capacity as defined by this section. In many places the addition of wood mezzanines may have corrected this problem, but there still exist instances where tall CMU 8-inch CMU walls (26+ feet) are restrained out-of-plane by anchors at 6 feet 8 inches o.c. and are insufficient per ASCE 41-17 section 4.4.3.7 "Quick Check".

RECOMMENDATION

A higher level of analysis should be done to verify "Quick Check" deficient CMU partitions restrained by the low roof diaphragm are in fact beyond the demand-to-capacity ratio. Furthermore, a more detailed investigation into the building's wood diaphragm connections to both precast concrete and CMU walls should be performed since it is unclear how these wood diaphragms transfer load to walls parallel to joists.

3.2.15 WOOD LEDGERS; TABLE 17-34 (06):

Wood ledgers added in 1983 and 1984 do not have clearly detailed connections to the CMU partition walls parallel to the wood joists. It seems reasonable to assume the same connection that was used perpendicular to the joist would also have been used. As detail is not provided, PND assumes blocking was not provided between the parallel joist and wall. Without this blocking, cross grain bending would be induced.

RECOMMENDATION

Joist bays parallel and adjacent to CMU partition walls should be checked for blocking between joist and wall and, if not present, blocking should be added. Furthermore, a more detailed investigation into the building's wood diaphragm connections to both precast concrete and CMU walls should be performed since it is unclear how these wood diaphragms transfer load to walls parallel to joists.

3.2.16 TRANSFER TO SHEAR WALLS; TABLE 17-34 (07):

This item was flagged not because diaphragms are not believed to be attached to walls, but because wood diaphragms in many places appear to be attached to walls detailed as partition walls, and not shear walls.

Furthermore, these diaphragms that are attached to partitions walls do not call out how they are to be attached to these partitions in plans.

RECOMMENDATION

A more detailed investigation into the building's wood diaphragm connections to CMU partition walls should be performed and specific care should be taken to ensure partition walls can take shear loading without unforeseen consequences.

3.2.17 NON-CHECKLIST STRUCTURAL OBSERVATIONS:

APPENDIX B, Figure B-47 shows a missing fastener in a shear tab connection above an overhead door. This is not likely an issue, but it seemed prudent to mention.

RECOMMENDATION

Replace the missing bolt or verify with an engineer that this is not a concern.

3.3 NON-STRUCTURAL EVALUATIONS

Non-structural components were evaluated per ASCE 41-17 Table 17-38 (APPENDIX C, C-7). Unlike structural components, which could be primarily evaluated from as-built documents, non-structural components were primarily identified during the site visit.

3.3.1 FIRE SUPPRESSION PIPING; TABLE 17-38 (01):

Improperly restrained fire suppression pipes were observed to be improperly restrained in the Paint Shop, shown in APPENDIX B figure B-26. This condition was observed sporadically throughout the building and is likely related to situations where providing bracing was difficult due to building geometry in that area.

RECOMMENDATIONS

In many situations, structural members are present to attach to. However, proper care should be exercised when attaching non-structural members to structural members, so code deficiencies are not created through improper placement. When a higher level of analysis is performed on the structural members, examining where and how unrestrained fire suppression can be anchored to structural members should be evaluated to alleviate this problem.

3.3.2 SPRINKLER CEILING CLEARANCE; TABLE 17-38 (05):

Insufficient sprinkler clearance was found throughout the building except Room 110 (APPENDIX B figure B-33). Room 110 appears to have had a recent retrofit of its integrated ceiling and is not only compliant to the best of our knowledge but could be used as an example of proper integrated ceiling.

RECOMMENDATIONS

Integrated ceiling grid should be updated like Room 110 and proper clearance provided for sprinklers.

3.3.3 HAZARDOUS MATERIAL STORAGE; TABLE 17-38 (14):

APPENDIX B Figures B-26 and 29 show what appears to be latex paint cans. However, cans could also include stains and varnishes that could be flammable or hazardous. Inventory of the items are not in the scope of this project. APPENDIX B figure B-89 shows unrestrained steel members with an oxyacetylene rig in front of them. Steel members falling on this rig during a seismic event could cause an explosion.

RECOMMENDATIONS

Even though paints may not be hazardous, the also present a fall-prone contents concern. A hinged lip rail could be added that hasps to the ends and would restrain cans from falling during a seismic event. The hasps could be released, and the lip rail swung down to allow for access when cans are needed. The oxyacetylene rig could simply be moved, and lines could be painted on the ground to prevent potentially hazardous items from being placed in front of object that could fall on it, but falling objects would still be a concern. Metal members should have some sort of restraint chain added to keep members from becoming free in a seismic event. Wood shop and wood member racks have this restraint; however, these members are much lighter than steel members so care should be taken to make sure restraint for steel is sufficient.

3.3.4 LIGHT PARTITIONS; TABLE 17-38 (16):

APPENDIX B figure B-77 shows an example of a partial height wall at mezzanine level in regulation that is restrained by the integrated ceiling, and the damage caused to this ceiling during the last seismic event. APPENDIX B figure B-78 shows that all the walls above regulation are either unrestrained or only restrained by the integrated ceiling.

RECOMMENDATIONS

Partitions should be tied, using bracing, back to the diaphragm, or should be framed at full height.

3.3.5 TOPS; TABLE 17-38 (18):

At the west end of the building, it was difficult to observe whether light partition walls that appear to extend from grade to low roof were sufficiently restrained. However, since they appear to go to the low roof deck, they are assumed to be properly restrained. No bracing was observed for light framed partial height (not extending to low roof) partition walls in the MCR open, MCR shop, or any partial height walls at mezzanine levels, as well as in the office areas at the east end of the building. APPENDIX B Figures B-45, 77, 78, and 88 show examples of walls that are not restrained at their tops. APPENDIX B Figure B-73 shows a wall that does have a kicker at the top but does not meet the 6 feet o.c. of the ASCE 41-17 guideline.

RECOMMENDATIONS

Walls in the MCR Open (APPENDIX B figure B-88) should be removed, framed full height, or have the diaphragm from the mezzanine above extended over the top. If the diaphragm is extended, an engineered detail should be provided to ensure that all elements meet modern seismic code. Walls under mezzanines should have kickers, like shown in APPENDIX B Figure B-73, added from tops of walls to undersides of mezzanines at 6 feet o.c. Walls above mezzanines should have kickers, like shown in APPENDIX B Figure B-73, added from the top of the wall to the underside of the low roof at 6 feet o.c. At the office areas at the east and, walls that are not CMU should be tied at the top to the floor above at a minimum of 6 feet o.c.

3.3.6 INTEGRATED CEILINGS; TABLE 17-38 (21):

No compression struts were observed and most of the ceiling had insufficient diagonal wires throughout the building (APPENDIX B Figures B 24, 25, 68, 73 & 75) except Room 110 (APPENDIX B Figure B-33). Room 110 appears to have had a recent retrofit of its integrated ceiling and is not only compliant to the best of our knowledge but could be used as an example of proper integrated ceiling.

RECOMMENDATIONS

The integrated ceiling grid should be updated like Room 110.

3.3.7 EDGE CLEARANCE; TABLE 17-38 (22):

No ¾-inch gap was observed between the integrated ceiling and any partitions throughout the building (APPENDIX B Figures B 24, 25, 68, 73 & 75) except Room 110 (APPENDIX B Figure B-33). Room 110 appears to have had a recent retrofit of its integrated ceiling and is not only compliant to the best of our knowledge but could be used as an example of proper integrated ceiling.

RECOMMENDATIONS

The integrated ceiling grid should be updated like Room 110.

3.3.8 EDGE SUPPORT; TABLE 17-38 (24):

Neither 2-inch closure angles nor channels were observed along any free edges throughout the building (APPENDIX B Figures B 24, 25, 68, 73 & 75) except Room 110 (APPENDIX B Figure B-33). Room 110 appears to have had a recent retrofit of its integrated ceiling and is not only compliant to the best of our knowledge but could be used as an example of proper integrated ceiling.

RECOMMENDATIONS

The integrated ceiling grid should be updated like Room 110.

3.3.9 INDEPENDENT SUPPORT; TABLE 17-38 (26):

Light fixtures were found to be improperly restrained throughout the building except (APPENDIX B Figures B 24, 25, 68, 73 & 75) Room 110 (APPENDIX B Figure B-33). Room 110 appears to have had a recent retrofit of its integrated ceiling and is not only compliant to the best of our knowledge but could be used as an example of proper integrated ceiling.

RECOMMENDATIONS

The integrated ceiling grid should be updated like Room 110.

3.3.10 PENDANT SUPPORTS; TABLE 17-38 (27):

APPENDIX B figure B-41 shows an example of a light suspended by a chain that would damage itself and surroundings during a seismic event. APPENDIX B Figure B-51 shows a set of lights that have what is considered a more “rigid” attachment; however, because of the long and thin nature of the connection, it is likely these lights will swing during a seismic event, damaging themselves and their surroundings. Instances like APPENDIX B Figure B-41 were observed primarily in closets or storage rooms. Lights suspended, as shown in APPENDIX B Figure B-51, were found throughout the west end warehouse.

RECOMMENDATIONS

Lights should be braced at 6 feet o.c., or, if unbraced, free to swing a 360-degree range of motion at no less than a 45° angle without contacting adjacent components. Chain suspended lights, as shown in APPENDIX B Figure B-41, can be corrected by shortening the length of the chains so that the light is not able to swing full range and damage surroundings. 45-degree chains could also be provided to prevent sway. For the longer rod light attachments shown in B-51, 45-degree chains would also provide restraint from sway.

3.3.11 OVERHEAD GLAZING; TABLE 17-38 (36):

UNKNOWN: Some windows had safety wire between panes. However, overhead windows without safety wire were not stamped to indicate whether safety glass was used.

RECOMMENDATIONS

Since the type of glazing used in overhead windows could not be determined with certainty, PND classified overhead glazing as Unknown the on checklist. It is likely that overhead glazing is safety glass. The glazing should be reviewed by a qualified glazing contractor to accurately determine the glazing type.

3.3.12 CANOPIES; TABLE 17-38 (46):

APPENDIX B, Figures B-10 through B-21 shows an exterior canopy composed of two Conex boxes with wheels removed, and a roof made of wood I joists tying the two boxes together. Conex boxes appear to be only partially restrained to the main building and have no attachment to the ground that can transfer shear forces other than friction. APPENDIX B, Figure B-22 shows a canopy that is attached to the main structure, but the attachment is made with bungie cords.

RECOMMENDATIONS

Canopies should be tied back to the structure at minimum of 6 feet o.c., or seismically isolated from the structure.

3.3.13 INDUSTRIAL STORAGE RACKS; TABLE 17-38 (53):

APPENDIX B, Figures B- 53-55, & 58 show industrial storage racks that are not tied to the ground or tied back to the structure.

These items were found in the MCR Open and Carpentry Shop.

RECOMMENDATIONS

These racks must be mechanically attached to the ground or tied back to the structure with a connection that is sufficient to restrain fulling loaded racks.

3.3.14 TALL NARROW CONTENTS; TABLE 17-38 (54):

APPENDIX B, Figures B- 37-39, 46, 52, 57, 62-67, 76, 80-82, 90, & 92-93 show examples of unrestrained contents. These conditions were common throughout the building.

Improperly restrained contents were found in Rooms 105, 150, C122, 246, 241, Corridor 170, Mezzanine 236, 238, & the Welding Shop.[18]

RECOMMENDATIONS

Sufficient anchoring for these components should be attached to the structure, or several components should be attached together such that height-to-depth or height-to-width ratios are greater than 3:1. While retrofitting, all narrow contents should be restrained.

3.3.15 FALL-PRONE CONTENTS; TABLE 17-38 (55):

APPENDIX B, Figures B- 27-29, 32-32, 34, 40, 42-44, 61, 66-67, 79, 83, 89 & 91 show examples of fall prone contents. These conditions were not uncommon throughout the building.

Improperly restrained contents were found in Rooms 50, 114A, 223A, Mezzanine 236, 238, Glass Shop, Door Shop, Paint Shop, and Welding Shop.[19]

The Glass Shop and Welding Shop have glass panes and steel members oriented vertically in stands. These objects pose an especially high danger, as falling would not only impede egress but could cause serious injury or even death.

RECOMMENDATIONS

All fall-prone contents weighing more than 20 pounds that are more than 4-5 feet above the ground should be restrained. Restraint can be provided by putting a lip or a chain on a shelf to prevent objects from falling out of their stands or moved below 4 feet from the floor.

3.3.16 SUSPENDED EQUIPMENT; TABLE 17-38 (63):

Appendix B Figures B- 30, 35, & 36 show suspended mechanical equipment, where restraint has either detached from structure or, due to the length of the suspending rod, was concerning to inspectors. Also, throughout the west end shops, large HVAC units were suspended from the roof deck. Though restraint did appear to be sufficient, if a higher level of analysis is performed, the units should check at to ensure they are properly restrained.

RECOMMENDATIONS

Provide an engineered mechanical connection such as an additional knee brace or arm to properly restrain heavy suspended equipment from swaying.

[18] Components may be added or removed from rooms at any time. As components in various rooms are often manipulated by teachers and staff. This list includes only observed deficiencies. However, it should not be assumed that deficiencies are limited to the provided list.

3.3.17 NON-CHECKLIST NON-STRUCTURAL OBSERVATIONS:

APPENDIX B-1 through B-9 show that entry and exit stairs at West end of the building have fallen into disrepair. Collapse during a seismic event might impede egress.

RECOMMENDATIONS

Replace stairs as soon as possible.

4 RECOMMENDATIONS

PND recommends partitions be either removed or retrofitted to meet code requirements for out-of-plane bracing. A higher form of analysis is also recommended for the braced frames to determine if existing conditions are sufficient. A retrofit or replacement of the dropped ceiling is also recommended to address many of the non-structural checklist items. An engineered connection should be applied to the exterior canopy. Most other non-structural checklist items could be corrected with a maintenance inspection to ensure contents are properly attached and stored. Finally, an ungrouped "Miscellaneous" category was created for items that would likely need to be addressed individually.

4.1 HIGHER LEVEL OF ANALYSIS (TABLE A-1)

Because the structure does not meet requirement criteria for a ASCE 41-17 Tier 1 inspection, a higher level of analysis should be done to verify the performance of this structure under a design standard event. This report can be used as a guide for determining where and what to take a more detailed look at, but, because this report is derived from structural observations, it is highly based on engineering judgement and no clear conclusions can be drawn from it.

4.2 RETROFIT OR REPLACE EXISTING DROPPED CEILING (TABLE A-2)

INTEGRATED CEILINGS, EDGE CLEARANCE, EDGE SUPPORT, INDEPENDANT SUPPORT, PENDANT SUPPORT, SPRINKLER CEILING CLEARANCE *Nonstructural Checklist* (ASCE 41-17 Table 17-38: 21, 22, 24, 26, 27, 05) Non-Compliant issues may all be rectified with retrofit or replacement of the dropped ceiling.

4.3 CANOPY ATTACHMENT (TABLE A-2)

The CANOPY *Nonstructural Checklist* (ASCE 41-17 Table 17-38: 46) issue may be resolved with an engineered connection tying the canopies to the structure, or removing canopies.

4.4 MAINTENANCE UPDATE OF SEISMIC ATTACHMENTS (TABLE A-2)

FIRE SUPPRESSION PIPING, HAZARDOUS MATERIAL STORAGE, INDUSTRIAL STORAGE RACKS, TALL NARROW CONTENTS, FALL-PRONE CONTENTS, SUSPENDED EQUIPMENT, *Nonstructural Checklist* (ASCE 41-17 Table 17-38: 01, 14, 53, 54, 55, 63) items may all be addressed with a thorough maintenance check to ensure various elements are properly restrained or attached. This report could be used as a punch list, but a secondary visual inspection could be performed to ensure all features are adequately attached.

4.5 RESTRAINT AT TOP OF PARTITION WALLS (TABLE A-2)

LIGHT PARTITIONS, and TOPS, *Nonstructural Checklist* (ASCE 41-17 Table 17-38: 16, 18) items may all be addressed by ensuring all partition walls have restraints tying them back to the floor above at minimum 6 feet o.c.

4.6 UNGROUPED / MISC (TABLE A-1 & A-2)

The OVERHEAD GLAZING *Nonstructural Checklist* (ASCE 41-17 Table 17-38: 36) item will require some form of testing to verify safety glazing.

APPENDIX A — ASD TIER 1 PRIORITY RANKINGS

TABLE A-1 RELATIVE PRIORITY RATING OF TIER 1 SCREENING DEFICIENCIES - STRUCTURAL ITEMS

CP&C **10.06.2021**

Relative Priority Rating of Tier 1 Screening Deficiencies - Structural Items

Ref Appendix 4 of ASD Seismic Evaluation & Retrofit Guide

			(0-5)	(1-5)	(1-4)	
Area	**Checklist**	**Item**	**Deficiency**	**Prevalence**	**Threat**	**Priority Rating**
Higher Level of Analysis	1, 2, 6,8,10,28,34	ALL	3	5	2	30
Ungrouped/MISC						
Structural – 1976 Building	17-2	10 - LIQUIFACTION[19]	5	5	4	100

[19] Liquefaction is an unknown, a site-specific geotechnical exploration or a detailed review of geotechnical reports from adjacent properties, if available, would be required to fully assess if a potential liquefaction risk exists. However, our visual site inspection and review of provided documentation found no indication that the existing foundation systems are under performing.

TABLE A-2 RELATIVE PRIORITY RATING OF TIER 1 SCREENING DEFICIENCIES - NON-STRUCTURAL ITEMS

CP&C **8.26.21**

Relative Priority Rating of Tier 1 Screening Deficiencies - Non-Structural Items

Ref Appendix 5 of ASD Seismic Evaluation & Retrofit Guide

			(0,2,5)	**(1-5)**	**(1,2,4)**	
Area	**Checklist**	**Item**	**Deficiency**	**Prevalence**	**Threat**	**Priority Rating**
Non-Compliant Partitions Retrofit						
Non-Structural - All Sections	17-38	15 - DRIFT	5	5	4	100
Non-Structural - All Sections	17-38	18 - TOPS	5	5	4	100
Non-Structural - All Sections	17-38	16 – LIGHT PARTITIONS	5	4	3	60
Retrofit or Replace Existing Dropped Ceiling						
Non-Structural - All Sections	17-38	21 – INTERGRATED CEILINGS	2	5	2	20
Non-Structural - All Sections	17-38	22 – EDGE CLEARANCE	2	5	2	20
Non-Structural - All Sections	17-38	24 – EDGE SUPPORT	2	5	2	20
Non-Structural - All Sections	17-38	26 – INDEPENDENT SUPPORT	2	5	2	20
Non-Structural - All Sections	17-38	05 – SPRINKLER CEILING CLEARANCE	2	5	2	20
Non-Structural - All Sections	17-38	27 – PENDANT SUPPORT	2	3	2	12
Canopy Attachment						
Non-Structural - Exterior	17-38	46 - CANOPIES	5	2	4	40
Maintenance Update of Seismic Attachments						
Non-Structural - All Sections	17-38	54 – TALL NARROW CONTENTS	5	5	2	50
Non-Structural - All Sections	17-38	55 – FALL-PRONE CONTENTS	5	5	2	50
Non-Structural – West Shops	17-38	63 – SUSPENDED EQUIMENT	5	2	5	50
Non-Structural - All Sections	17-38	53 – INDUSTRIAL STORAGE RACKS	5	2	2	20
Non-Structural – All Sections	17-38	01 – FIRE SUPRESSION	2	2	1	4
Ungrouped / MISC						
Non-Structural - All Sections	17-38	36 – OVERHEAD GLAZING	5	2	4	40

TABLE A-3 OVERALL BUILDING PERFORMANCE LEVEL

Without a higher level of analysis, this is no proper means to rate structural performance of this structure.

APPENDIX B — SITE VISIT PHOTOS

Vehicle Shop, West Bay Exit Figure B- 1

Vehicle Shop, West Bay Exit, Hand Rail Figure B- 2

Vehicle Shop, West Bay Exit, Landing Base Attachment Figure B- 3

Vehicle Shop, West Bay Exit, Landing Ledger Figure B- 4

Vehicle Shop, West Man Door, Stairs Figure B- 5

Vehicle Shop, West Man Door, Stair Attachment Figure B- 6

Vehicle Shop, West Man Door, Cantilever Landing Figure B- 7

Vehicle Shop, West Man Door, Landing Ledger Figure B- 8

Vehicle Shop, West Man Door, Landing Ledger Figure B- 9

Vehicle Shop, West Bays Canopy Figure B- 10

Vehicle Shop, West Bays Canopy Figure B- 11

Vehicle Shop, West Bays Canopy Figure B- 12

Vehicle Shop, West Bays Canopy, Base Support Figure B- 13

Vehicle Shop, West Bays Canopy, Roof Attachment Figure B- 14

Vehicle Shop, West Bays Canopy, Conex to Main Structure B- 15

Vehicle Shop, West Bays Canopy, Roof Attachment B- 16

Vehicle Shop, West Bays Canopy, Base Support Figure B- 17

Vehicle Shop, West Bays Canopy, Base Support Figure B- 18

Vehicle Shop, West Bays Canopy, Conex to Main Structure B- 19

Vehicle Shop, West Bays Canopy, Conex to Main Structure B- 20

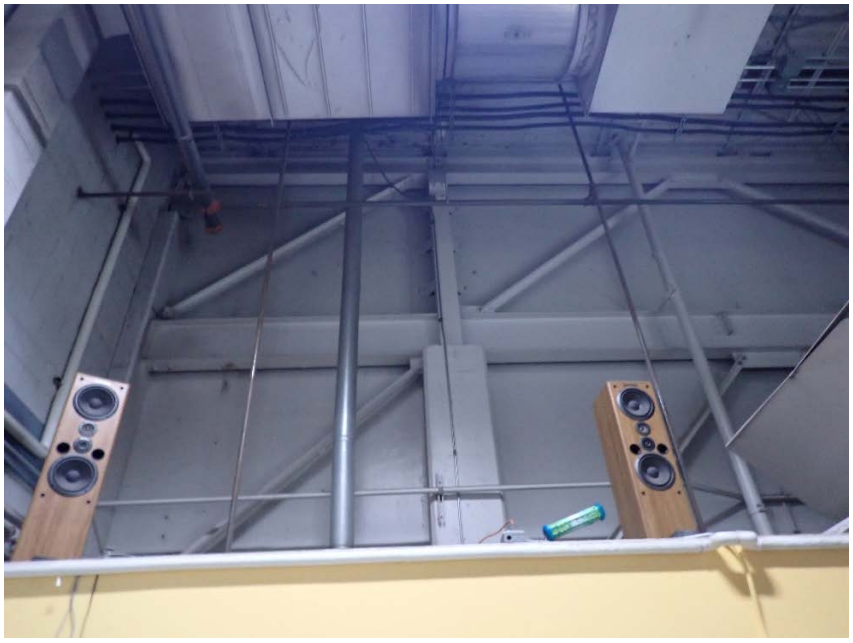
Vehicle Shop, West Bays Canopy, Conex to Main Structure B- 21

Vehicle Shop, South Canopy Figure B- 22

Corridor 150, Lack of Edge Clearance, Damage Figure B- 23

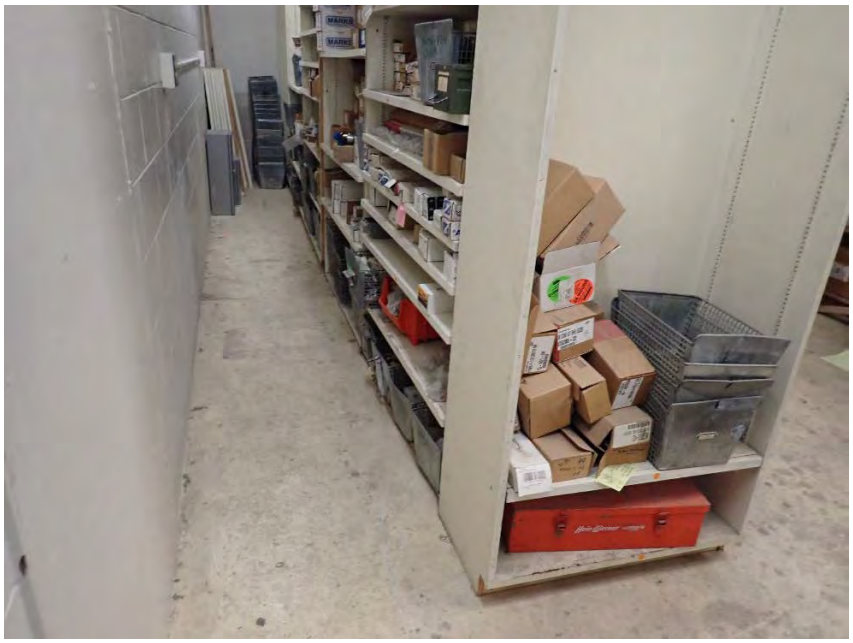
Corridor 150, Lack of Light Independent Support Figure B- 24

Corridor 150, Lack of Light Compression Strut Figure B- 25



Paint Shop, Improperly Restrained Piping and Vent Figure B- 26

Paint Shop, Fall Prone Contents Figure B- 27



Door Shop, Unrestrained Shelves & Fall Prone Contents Figure B- 28

Room 60, Fall Prone Contents Figure B- 29

Glass Shop, Improperly Restrained Mechanical Unit

Conduit Detached from Wall

Figure B- 30

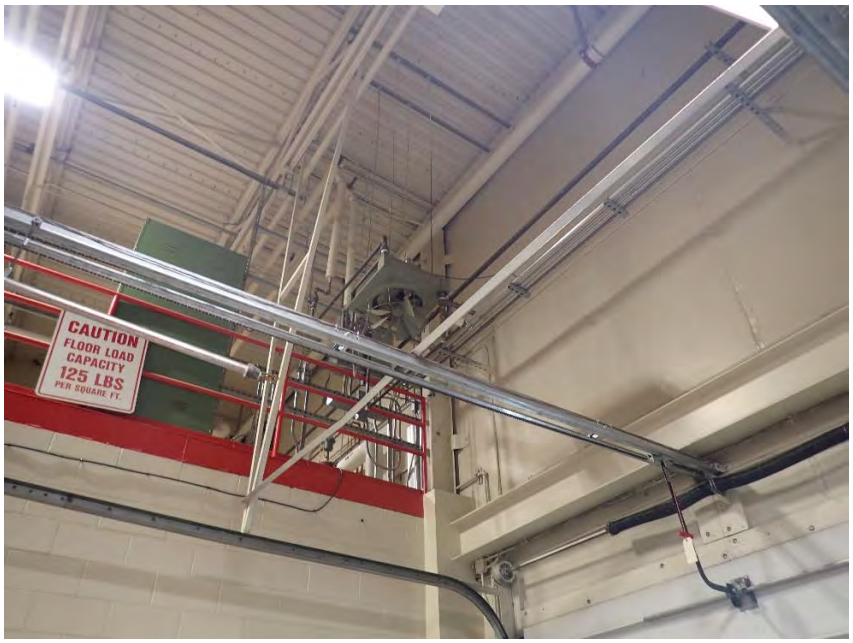
Glass Shop, Fall Prone Contents Figure B- 31

Glass Shop, Fall Prone Contents Figure B- 32

MCR Storage, Proper Integrated Ceiling Figure B- 33

Room 110A, Fall Prone Contents Figure B- 34

Room 105, Improperly Restrained Fan Figure B- 35

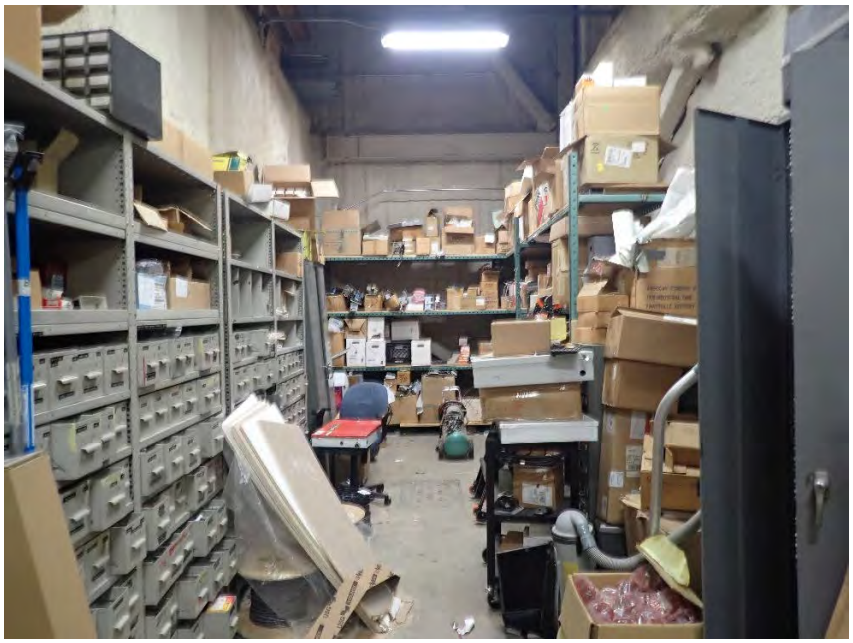


Room 105, Improperly Restrained Fan Figure B- 36

Room 105, Tall Narrow Contents Figure B- 37

Corridor 170, Tall Narrow Contents Figure B- 38

Corridor 180, Tall Narrow Contents Figure B- 39



Room 114B, Fall Prone Contents Figure B- 40

Room 114B, Pendulum Light Figure B- 41

Room 223A, Fall Prone Contents Figure B- 42

Room 223A, Fall Prone Contents Figure B- 43

Room 223A, Fall Prone Contents Figure B- 44

Room 368-369, Top of Wall Unrestrained Figure B- 45

Room 150, Tall Narrow Contents Figure B- 46

Vehicle Shop, South Bay Door, Header Missing Bolt Figure B- 47

Vehicle Shop, Improperly Restrained Lighting Figure B- 48

Carpentry Shop, C122, Tall Narrow Contents Figure B- 49

Carpentry Shop, Industrial Storage Racks Figure B- 50

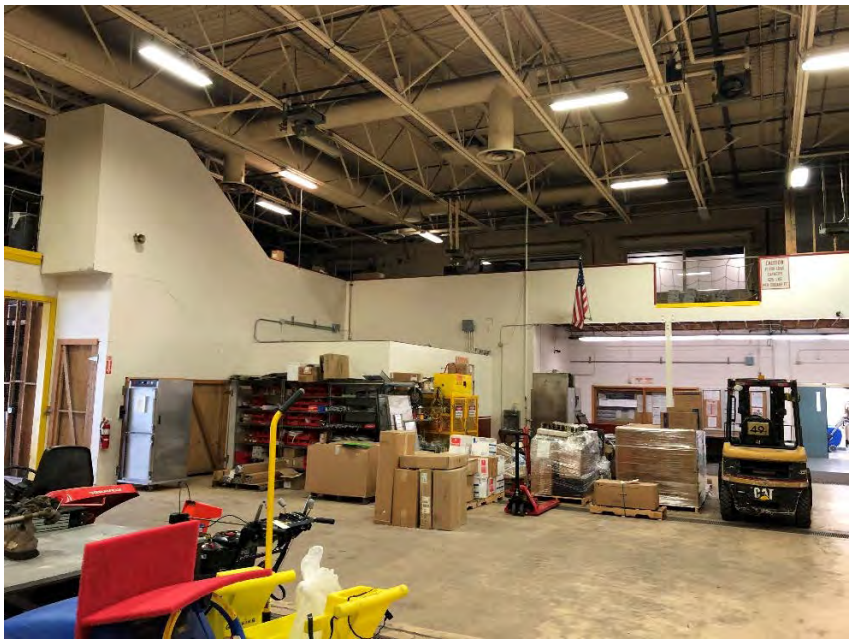
Carpentry Shop, Industrial Storage Racks Figure B- 51

Carpentry Shop, Industrial Storage Racks Figure B- 52

Carpentry Shop, Mezzanine 247, Load Path Figure B- 53

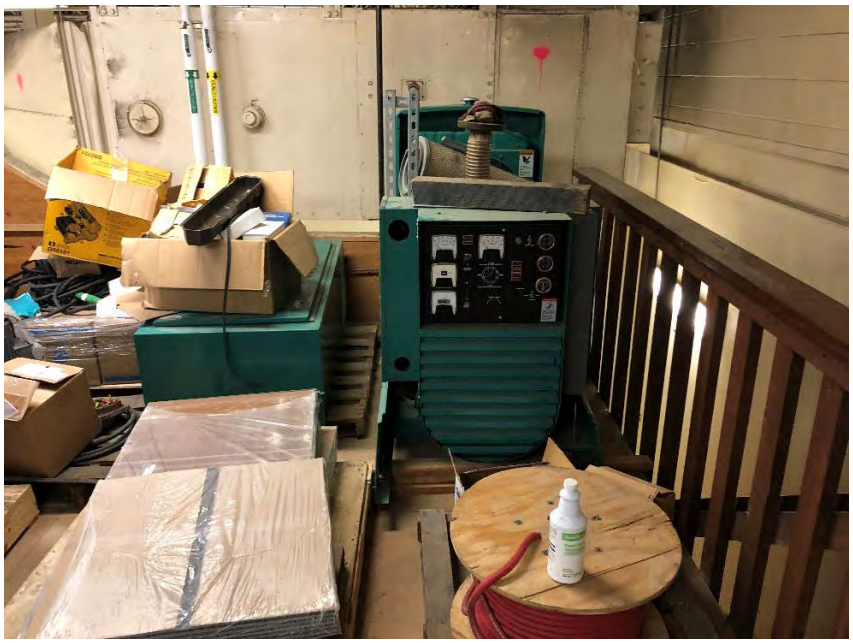
Room 246, Tall Narrow Contents Figure B- 54

MCR Open Circulation, Industrial Storage Racks Figure B- 55



MCR Open Circulation, Overall Figure B- 56

Room 116, Wood Shear Wall Figure B- 57



MCR Mezzanine 236, Fall Prone Contents Figure B- 58

MCR Mezzanine 236, Tall Narrow Contents Figure B- 59

MCR Mezzanine 236, Tall Narrow Contents Figure B- 60

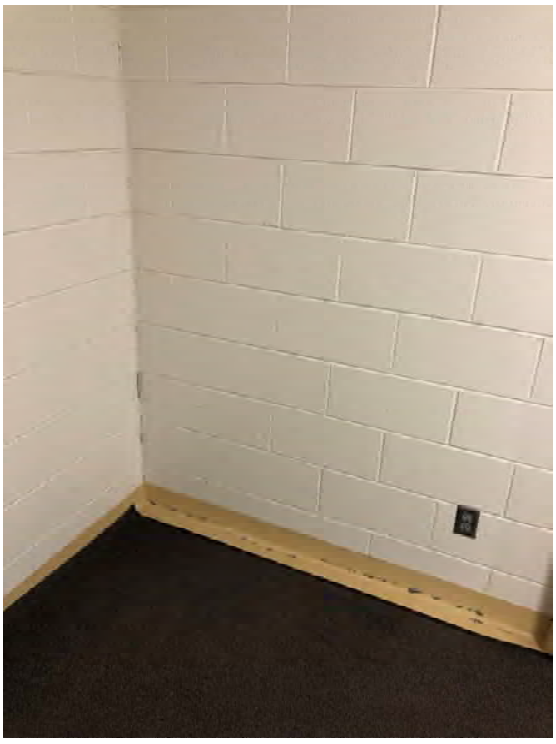
MCR Mezzanine 236, CMU Cracking Figure B- 61

MCR Mezzanine 236, CMU Cracking Figure B- 62

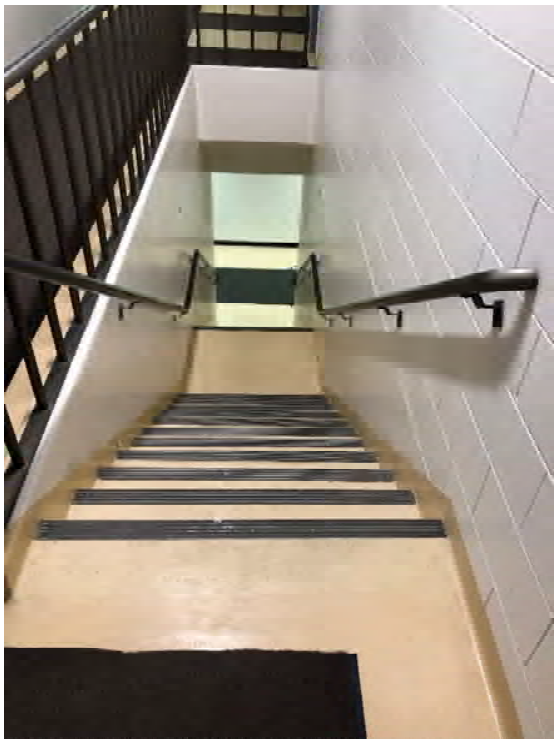
Electronic, Fall Prone Contents Figure B- 63

Electronic, Fall Prone Contents Figure B- 64

Electronic, Integrated Ceilings Figure B- 65



SW-3, CMU Cracking Figure B- 66



SW-3, CMU Cracking Figure B- 67

SW-3, CMU Cracking Figure B- 68

SW-3, CMU Cracking Figure B- 69

MCR Office, Ceilings Figure B- 70

Corridor 190, Wood Shear Wall Figure B- 71

Corridor 190, Wood Shear Wall Figure B- 72

Regulation Room 241, Tall Narrow Contents Figure B- 73

Regulation Room 242, Lack of Edge Clearance, Damage Figure B- 74

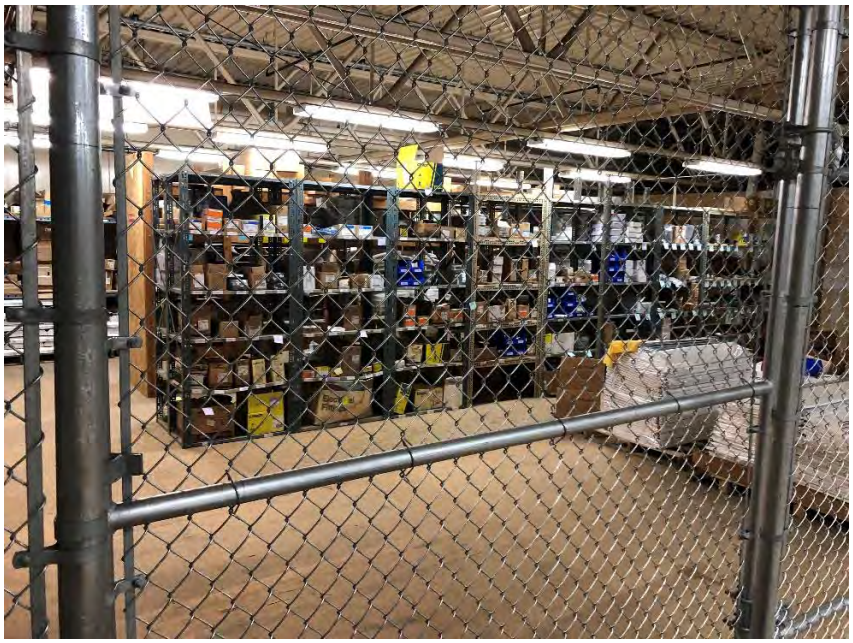
Regulation, Partitions Unrestrained Figure B- 75

Mezzanine 238, Fall Prone Contents Figure B- 76

Mezzanine 238, Tall Narrow Contents Figure B- 77

Mezzanine 238, Tall Narrow Contents Figure B- 78

Mezzanine 238, Fall Prone Contents Figure B- 79

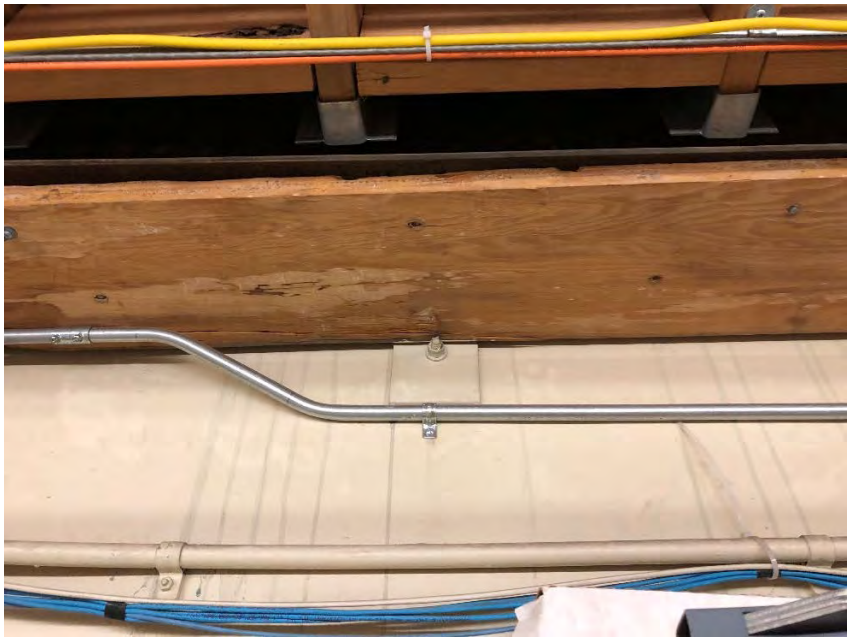


Mezzanine 238, Fall Prone Contents Figure B- 80

MCR Shop, Floor to Exterior Wall Attachment Figure B- 81

MCR Shop, Floor to Exterior Wall Attachment Figure B- 82

MCR Shop, Floor to Exterior Wall Attachment Figure B- 83

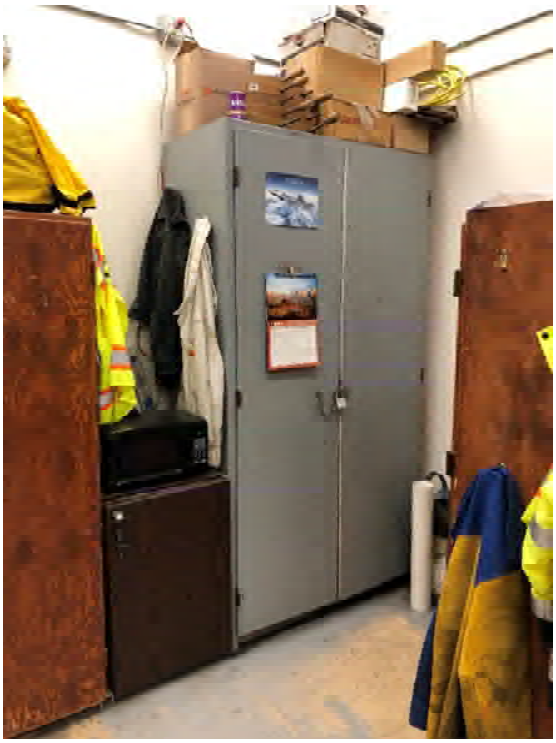


MCR Shop, Floor to Exterior Wall Attachment Figure B- 84

MCR Open Circulation, Partitions Improperly Restrained Figure B- 85

Welding Shop, Fall Prone Contents Figure B- 86

Welding Shop, Tall Narrow Contents Figure B- 87



Welding Shop, Fall Prone Contents Figure B- 88

Welding Shop, Tall Narrow Contents Figure B- 89

Welding Shop, Tall Narrow Contents Figure B- 90

Welding Shop, Unrestrained Equipment Figure B- 91

Welding Shop, Unrestrained Equipment Figure B- 92

Welding Shop, Unrestrained Equipment Figure B- 93

Welding Shop, Unrestrained Equipment Figure B- 94

APPENDIX C — ASCE 41-17 TIER 1 CHECKLIST

C-1 TABLE 17-1 & 17-2 COLLAPSE PREVENTION BASIC CONFIGURATION CHECKLIST

Table 17-1. Very Low Seismicity Checklist

	Status	Evaluation Statement	Tier 2 Reference	Commentary Reference
	Structural Components			
01	C NC N/A U	LOAD PATH: The structure contains a complete, well-defined load path, including structural elements and connections, that serves to transfer the inertial forces associated with the mass of all elements of the building to the foundation.	5.4.1.1	A.2.1.1
02	C NC N/A U	WALL ANCHORAGE: Exterior concrete or masonry walls that are dependent on the diaphragm for lateral support are anchored for out-of-plane forces at each diaphragm level with steel anchors, reinforcing dowels, or straps that are developed into the diaphragm. Connections have adequate strength to resist the connection force calculated in the Quick Check procedure of Section 4.4.3.7.	5.7.1.1	A.5.1.1

Note: C = Compliant, NC = Noncompliant, N/A = Not Applicable, and U = Unknown.

Table 17-2. Collapse Prevention Basic Configuration Checklist

	Status	Evaluation Statement	Tier 2 Reference	Commentary Reference
	Low Seismicity			
	Building System—General			
01	C NC N/A U	LOAD PATH: The structure contains a complete, well-defined load path, including structural elements and connections, that serves to transfer the inertial forces associated with the mass of all elements of the building to the foundation.	5.4.1.1	A.2.1.1
02	C NC N/A U	ADJACENT BUILDINGS: The clear distance between the building being evaluated and any adjacent building is greater than 0.25% of the height of the shorter building in low seismicity, 0.5% in moderate seismicity, and 1.5% in high seismicity.	5.4.1.2	A.2.1.2
03	C NC N/A U	MEZZANINES: Interior mezzanine levels are braced independently from the main structure or are anchored to the seismic-force-resisting elements of the main structure.	5.4.1.3	A.2.1.3
	Building System—Building Configuration			
04	C NC N/A U	WEAK STORY: The sum of the shear strengths of the seismic-force-resisting system in any story in each direction is not less than 80% of the strength in the adjacent story above.	5.4.2.1	A.2.2.2
05	C NC N/A U	SOFT STORY: The stiffness of the seismic-force-resisting system in any story is not less than 70% of the seismic-force-resisting system stiffness in an adjacent story above or less than 80% of the average seismic-force-resisting system stiffness of the three stories above.	5.4.2.2	A.2.2.3
06	C NC N/A U	VERTICAL IRREGULARITIES: All vertical elements in the seismic-force-resisting system are continuous to the foundation.	5.4.2.3	A.2.2.4
07	C NC N/A U	GEOMETRY: There are no changes in the net horizontal dimension of the seismic-force-resisting system of more than 30% in a story relative to adjacent stories, excluding one-story penthouses and mezzanines.	5.4.2.4	A.2.2.5
08	C NC N/A U	MASS: There is no change in effective mass of more than 50% from one story to the next. Light roofs, penthouses, and mezzanines need not be considered.	5.4.2.5	A.2.2.6
09	C NC N/A U	TORSION: The estimated distance between the story center of mass and the story center of rigidity is less than 20% of the building width in either plan dimension.	5.4.2.6	A.2.2.7

continues

Table 17-2 *(Continued)*. Collapse Prevention Basic Configuration Checklist

	Status	Evaluation Statement	Tier 2 Reference	Commentary Reference
		Moderate Seismicity (Complete the Following Items in Addition to the Items for Low Seismicity)		
		Geologic Site Hazards		
10	C NC N/A U	LIQUEFACTION: Liquefaction-susceptible, saturated, loose granular soils that could jeopardize the building's seismic performance do not exist in the foundation soils at depths within 50 ft (15.2 m) under the building.	5.4.3.1	A.6.1.1
11	C NC N/A U	SLOPE FAILURE: The building site is located away from potential earthquake-induced slope failures or rockfalls so that it is unaffected by such failures or is capable of accommodating any predicted movements without failure.	5.4.3.1	A.6.1.2
12	C NC N/A U	SURFACE FAULT RUPTURE: Surface fault rupture and surface displacement at the building site are not anticipated.	5.4.3.1	A.6.1.3
		High Seismicity (Complete the Following Items in Addition to the Items for Moderate Seismicity)		
		Foundation Configuration		
13	C NC N/A U	OVERTURNING: The ratio of the least horizontal dimension of the seismic-force-resisting system at the foundation level to the building height (base/height) is greater than $0.6S_a$.	5.4.3.3	A.6.2.1
14	C NC N/A U	TIES BETWEEN FOUNDATION ELEMENTS: The foundation has ties adequate to resist seismic forces where footings, piles, and piers are not restrained by beams, slabs, or soils classified as Site Class A, B, or C.	5.4.3.4	A.6.2.2

Note: C = Compliant, NC = Noncompliant, N/A = Not Applicable, and U = Unknown.

C-2 Table 17-6 Collapse Prevention Structural Checklist for Building Type W2

Table 17-6. Collapse Prevention Structural Checklist for Building Type W2

	Status	Evaluation Statement	Tier 2 Reference	Commentary Reference
		Low and Moderate Seismicity		
		Seismic-Force-Resisting System		
01	C NC N/A U	REDUNDANCY: The number of lines of shear walls in each principal direction is greater than or equal to 2.	5.5.1.1	A.3.2.1.1
02	C NC N/A U	SHEAR STRESS CHECK: The shear stress in the shear walls, calculated using the Quick Check procedure of Section 4.4.3.3, is less than the following values: Structural panel sheathing 1,000 lb/ft Diagonal sheathing 700 lb/ft Straight sheathing 100 lb/ft All other conditions 100 lb/ft	5.5.3.1.1	A.3.2.7.1
03	C NC N/A U	STUCCO (EXTERIOR PLASTER) SHEAR WALLS: Multi-story buildings do not rely on exterior stucco walls as the primary seismic-force-resisting system.	5.5.3.6.1	A.3.2.7.2
04	C NC N/A U	GYPSUM WALLBOARD OR PLASTER SHEAR WALLS: Interior plaster or gypsum wallboard is not used for shear walls on buildings more than one story high with the exception of the uppermost level of a multi-story building.	5.5.3.6.1	A.3.2.7.3
05	C NC N/A U	NARROW WOOD SHEAR WALLS: Narrow wood shear walls with an aspect ratio greater than 2-to-1 are not used to resist seismic forces.	5.5.3.6.1	A.3.2.7.4
06	C NC N/A U	WALLS CONNECTED THROUGH FLOORS: Shear walls have an interconnection between stories to transfer overturning and shear forces through the floor.	5.5.3.6.2	A.3.2.7.5
07	C NC N/A U	HILLSIDE SITE: For structures that are taller on at least one side by more than one-half story because of a sloping site, all shear walls on the downhill slope have an aspect ratio less than 1-to-1.	5.5.3.6.3	A.3.2.7.6
08	C NC N/A U	CRIPPLE WALLS: Cripple walls below first-floor-level shear walls are braced to the foundation with wood structural panels.	5.5.3.6.4	A.3.2.7.7
09	C NC N/A U	OPENINGS: Walls with openings greater than 80% of the length are braced with wood structural panel shear walls with aspect ratios of not more than 1.5-to-1 or are supported by adjacent construction through positive ties capable of transferring the seismic forces.	5.5.3.6.5	A.3.2.7.8
10	**Connections**			
	C NC N/A U	WOOD POSTS: There is a positive connection of wood posts to the foundation.	5.7.3.3	A.5.3.3
11	C NC N/A U	WOOD SILLS: All wood sills are bolted to the foundation.	5.7.3.3	A.5.3.4
12	C NC N/A U	GIRDER–COLUMN CONNECTION: There is a positive connection using plates, connection hardware, or straps between the girder and the column support.	5.7.4.1	A.5.4.1
		High Seismicity (Complete the Following Items in Addition to the Items for Low and Moderate Seismicity)		
		Connections		
13	C NC N/A U	WOOD SILL BOLTS: Sill bolts are spaced at 6 ft (1.8 m) or less with acceptable edge and end distance provided for wood and concrete.	5.7.3.3	A.5.3.7
		Diaphragms		
14	C NC N/A U	DIAPHRAGM CONTINUITY: The diaphragms are not composed of split-level floors and do not have expansion joints.	5.6.1.1	A.4.1.1
15	C NC N/A U	ROOF CHORD CONTINUITY: All chord elements are continuous, regardless of changes in roof elevation.	5.6.1.1	A.4.1.3
16	C NC N/A U	DIAPHRAGM REINFORCEMENT AT OPENINGS: There is reinforcing around all diaphragm openings larger than 50% of the building width in either major plan dimension.	5.6.1.5	A.4.1.8
17	C NC N/A U	STRAIGHT SHEATHING: All straight-sheathed diaphragms have aspect ratios less than 2-to-1 in the direction being considered.	5.6.2	A.4.2.1
18	C NC N/A U	SPANS: All wood diaphragms with spans greater than 24 ft (7.3 m) consist of wood structural panels or diagonal sheathing.	5.6.2	A.4.2.2
19	C NC N/A U	DIAGONALLY SHEATHED AND UNBLOCKED DIAPHRAGMS: All diagonally sheathed or unblocked wood structural panel diaphragms have horizontal spans less than 40 ft (12.2 m) and have aspect ratios less than or equal to 4-to-1.	5.6.2	A.4.2.3
20	C NC N/A U	OTHER DIAPHRAGMS: The diaphragms do not consist of a system other than wood, metal deck, concrete, or horizontal bracing.	5.6.5	A.4.7.1

Note: C = Compliant, NC = Noncompliant, N/A = Not Applicable, and U = Unknown.

C-3 Table 17-8 Collapse Prevention Structural Checklist for Building Type S1 and S1A

Table 17-8. Collapse Prevention Structural Checklist for Building Types S1 and S1a

	Status	Evaluation Statement	Tier 2 Reference	Commentary Reference
		Low Seismicity		
		Seismic-Force-Resisting System		
01	C NC N/A U	REDUNDANCY: The number of lines of moment frames in each principal direction is greater than or equal to 2.	5.5.1.1	A.3.1.1.1
02	C NC N/A U	DRIFT CHECK: The drift ratio of the steel moment frames, calculated using the Quick Check procedure of Section 4.4.3.1, is less than 0.030.	5.5.2.1.2	A.3.1.3.1
03	C NC N/A U	COLUMN AXIAL STRESS CHECK: The axial stress caused by gravity loads in columns subjected to overturning forces is less than $0.10F_y$. Alternatively, the axial stress caused by overturning forces alone, calculated using the Quick Check procedure of Section 4.4.3.6, is less than $0.30F_y$.	5.5.2.1.3	A.3.1.3.2
04	C NC N/A U	FLEXURAL STRESS CHECK: The average flexural stress in the moment frame columns and beams, calculated using the Quick Check procedure of Section 4.4.3.9, is less than F_y. Columns need not be checked if the strong column–weak beam checklist item is compliant.	5.5.2.1.2	A.3.1.3.3
		Connections		
05	C NC N/A U	TRANSFER TO STEEL FRAMES: Diaphragms are connected for transfer of seismic forces to the steel frames.	5.7.2	A.5.2.2
06	C NC N/A U	STEEL COLUMNS: The columns in seismic-force-resisting frames are anchored to the building foundation.	5.7.3.1	A.5.3.1
		Moderate Seismicity (Complete the Following Items in Addition to the Items for Low Seismicity)		
		Seismic-Force-Resisting System		
07	C NC N/A U	REDUNDANCY: The number of bays of moment frames in each line is greater than or equal to 2.	5.5.1.1	A.3.1.1.1
08	C NC N/A U	INTERFERING WALLS: All concrete and masonry infill walls placed in moment frames are isolated from structural elements.	5.5.2.1.1	A.3.1.2.1
09	C NC N/A U	MOMENT-RESISTING CONNECTIONS: All moment connections can develop the strength of the adjoining members based on the specified minimum yield stress of steel.	5.5.2.2.1	A.3.1.3.4
		High Seismicity (Complete the Following Items in Addition to the Items for Low and Moderate Seismicity)		
		Seismic-Force-Resisting System		
10	C NC N/A U	MOMENT-RESISTING CONNECTIONS: All moment connections are able to develop the strength of the adjoining members or panel zones based on 110% of the expected yield stress of the steel in accordance with AISC 341, Section A3.2.	5.5.2.2.1	A.3.1.3.4
11	C NC N/A U	PANEL ZONES: All panel zones have the shear capacity to resist the shear demand required to develop 0.8 times the sum of the flexural strengths of the girders framing in at the face of the column.	5.5.2.2.2	A.3.1.3.5
12	C NC N/A U	COLUMN SPLICES: All column splice details located in moment-resisting frames include connection of both flanges and the web.	5.5.2.2.3	A.3.1.3.6
13	C NC N/A U	STRONG COLUMN—WEAK BEAM: The percentage of strong column–weak beam joints in each story of each line of moment frames is greater than 50%.	5.5.2.1.5	A.3.1.3.7
14	C NC N/A U	COMPACT MEMBERS: All frame elements meet section requirements in accordance with AISC 341, Table D1.1, for moderately ductile members.	5.5.2.2.4	A.3.1.3.8
		Diaphragms (Stiff or Flexible)		
15	C NC N/A U	OPENINGS AT FRAMES: Diaphragm openings immediately adjacent to the moment frames extend less than 25% of the total frame length.	5.6.1.3	A.4.1.5
16		**Flexible Diaphragms**		
	C NC N/A U	CROSS TIES: There are continuous cross ties between diaphragm chords.	5.6.1.2	A.4.1.2
17	C NC N/A U	STRAIGHT SHEATHING: All straight-sheathed diaphragms have aspect ratios less than 2-to-1 in the direction being considered.	5.6.2	A.4.2.1
18	C NC N/A U	SPANS: All wood diaphragms with spans greater than 24 ft (7.3 m) consist of wood structural panels or diagonal sheathing.	5.6.2	A.4.2.2
19	C NC N/A U	DIAGONALLY SHEATHED AND UNBLOCKED DIAPHRAGMS: All diagonally sheathed or unblocked wood structural panel diaphragms have horizontal spans less than 40 ft (12.2 m) and aspect ratios less than or equal to 4-to-1.	5.6.2	A.4.2.3
20	C NC N/A U	OTHER DIAPHRAGMS: Diaphragms do not consist of a system other than wood, metal deck, concrete, or horizontal bracing.	5.6.5	A.4.7.1

Note: C = Compliant, NC = Noncompliant, N/A = Not Applicable, and U = Unknown.

Clouded Items are applicable, however under a tier 1, these items can not be reliable estimated, because checks would require a higher level of analysis than is laid out in a teir 1, due to rigidity, mixed systems, composite sections, and buiult up sections

C-4 Table 17-10 Collapse Prevention Structural Checklist for Building Type S2 and S2a

Table 17-10. Collapse Prevention Structural Checklist for Building Types S2 and S2a

	Status	Evaluation Statement	Tier 2 Reference	Commentary Reference
		Low Seismicity		
		Seismic-Force-Resisting System		
01	C NC N/A U	REDUNDANCY: The number of lines of braced frames in each principal direction is greater than or equal to 2.	5.5.1.1	A.3.3.1.1
02	C NC N/A U	COLUMN AXIAL STRESS CHECK: The axial stress caused by gravity loads in columns subjected to overturning forces is less than $0.10F_y$. Alternatively, the axial stress caused by overturning forces alone, calculated using the Quick Check procedure of Section 4.4.3.6, is less than $0.30F_y$.	5.5.2.1.3	A.3.1.3.2
03	C NC N/A U	BRACE AXIAL STRESS CHECK: The axial stress in the diagonals, calculated using the Quick Check procedure of Section 4.4.3.4, is less than $0.50F_y$.	5.5.4.1	A.3.3.1.2
		Connections		
04	C NC N/A U	TRANSFER TO STEEL FRAMES: Diaphragms are connected for transfer of seismic forces to the steel frames.	5.7.2	A.5.2.2
05	C NC N/A U	STEEL COLUMNS: The columns in seismic-force-resisting frames are anchored to the building foundation.	5.7.3.1	A.5.3.1
		Moderate Seismicity (Complete the Following Items in Addition to the Items for Low Seismicity)		
		Seismic-Force-Resisting System		
06	C NC N/A U	REDUNDANCY: The number of braced bays in each line is greater than 2.	5.5.1.1	A.3.3.1.1
07	C NC N/A U	CONNECTION STRENGTH: All the brace connections develop the buckling capacity of the diagonals.	5.5.4.4	A.3.3.1.5
08	C NC N/A U	COMPACT MEMBERS: All brace elements meet compact section requirements in accordance with AISC 360, Table B4.1.	5.5.4	A.3.3.1.7
09	C NC N/A U	K-BRACING: The bracing system does not include K-braced bays.	5.5.4.6	A.3.3.2.1
		High Seismicity (Complete the Following Items in Addition to the Items for Low and Moderate Seismicity)		
		Seismic-Force-Resisting System		
10	C NC N/A U	COLUMN SPLICES: All column splice details located in braced frames develop 50% of the tensile strength of the column.	5.5.4.2	A.3.3.1.3
11	C NC N/A U	SLENDERNESS OF DIAGONALS: All diagonal elements required to carry compression have Kl/r ratios less than 200.	5.5.4.3	A.3.3.1.4
12	C NC N/A U	CONNECTION STRENGTH: All the brace connections develop the yield capacity of the diagonals.	5.5.4.4	A.3.3.1.5
13	C NC N/A U	COMPACT MEMBERS: All brace elements meet section requirements in accordance with AISC 341, Table D1.1, for moderately ductile members.	5.5.4	A.3.3.1.7
14	C NC N/A U	CHEVRON BRACING: Beams in chevron, or V-braced, bays are capable of resisting the vertical load resulting from the simultaneous yielding and buckling of the brace pairs.	5.5.4.6	A.3.3.2.3
15	C NC N/A U	CONCENTRICALLY BRACED FRAME JOINTS: All the diagonal braces frame into the beam–column joints concentrically.	5.5.4.8	A.3.3.2.4
		Diaphragms (Stiff or Flexible)		
16	C NC N/A U	OPENINGS AT FRAMES: Diaphragm openings immediately adjacent to the braced frames extend less than 25% of the frame length.	5.6.1.3	A.4.1.5
		Flexible Diaphragms		
17	C NC N/A U	CROSS TIES: There are continuous cross ties between diaphragm chords.	5.6.1.2	A.4.1.2
18	C NC N/A U	STRAIGHT SHEATHING: All straight-sheathed diaphragms have aspect ratios less than 2-to-1 in the direction being considered.	5.6.2	A.4.2.1
19	C NC N/A U	SPANS: All wood diaphragms with spans greater than 24 ft (7.3 m) consist of wood structural panels or diagonal sheathing.	5.6.2	A.4.2.2
20	C NC N/A U	DIAGONALLY SHEATHED AND UNBLOCKED DIAPHRAGMS: All diagonally sheathed or unblocked wood structural panel diaphragms have horizontal spans less than 40 ft (12.2 m) and aspect ratios less than or equal to 4-to-1.	5.6.2	A.4.2.3
21	C NC N/A U	OTHER DIAPHRAGMS: Diaphragms do not consist of a system other than wood, metal deck, concrete, or horizontal bracing.	5.6.5	A.4.7.1

Note: C = Compliant, NC = Noncompliant, N/A = Not Applicable, and U = Unknown.

C-5 Table 17-28 Collapse Prevention Structural Checklist for Building Type PC1 and PC1a

Table 17-28. Collapse Prevention Structural Checklist for Building Types PC1 and PC1a

	Status	Evaluation Statement	Tier 2 Reference	Commentary Reference
	Low Seismicity			
	Connections			
01	C NC N/A U	WALL ANCHORAGE: Exterior concrete or masonry walls that are dependent on the diaphragm for lateral support are anchored for out-of-plane forces at each diaphragm level with steel anchors, reinforcing dowels, or straps that are developed into the diaphragm. Connections have strength to resist the connection force calculated in the Quick Check procedure of Section 4.4.3.7.	5.7.1.1	A.5.1.1
	Moderate Seismicity (Complete the Following Items in Addition to the Items for Low Seismicity)			
	Seismic-Force-Resisting System			
02	C NC N/A U	REDUNDANCY: The number of lines of shear walls in each principal direction is greater than or equal to 2.	5.5.1.1	A.3.2.1.1
03	C NC N/A U	WALL SHEAR STRESS CHECK: The shear stress in the precast panels, calculated using the Quick Check procedure of Section 4.4.3.3, is less than the greater of 100 lb/in.^{2} (0.69 MPa) or $2\sqrt{f'_c}$.	5.5.3.1.1	A.3.2.3.1
04	C NC N/A U	REINFORCING STEEL: The ratio of reinforcing steel area to gross concrete area is not less than 0.0012 in the vertical direction and 0.0020 in the horizontal direction.	5.5.3.1.3	A.3.2.3.2
05	C NC N/A U	WALL THICKNESS: Thicknesses of bearing walls are not less than 1/40 the unsupported height or length, whichever is shorter, nor less than 4 in. (101 mm).	5.5.3.1.2	A.3.2.3.5
	Diaphragms			
06	C NC N/A U	TOPPING SLAB: Precast concrete diaphragm elements are interconnected by a continuous reinforced concrete topping slab with a minimum thickness of 2 in. (51 mm).	5.6.4	A.4.5.1
	Connections			
07	C NC N/A U	WOOD LEDGERS: The connection between the wall panels and the diaphragm does not induce cross-grain bending or tension in the wood ledgers.	5.7.1.3	A.5.1.2
08	C NC N/A U	TRANSFER TO SHEAR WALLS: Diaphragms are connected for transfer of seismic forces to the shear walls.	5.7.2	A.5.2.1
09	C NC N/A U	TOPPING SLAB TO WALLS OR FRAMES: Reinforced concrete topping slabs that interconnect the precast concrete diaphragm elements are doweled for transfer of forces into the shear wall or frame elements.	5.7.2	A.5.2.3
10	C NC N/A U	GIRDER–COLUMN CONNECTION: There is a positive connection using plates, connection hardware, or straps between the girder and the column support.	5.7.4.1	A.5.4.1
	High Seismicity (Complete the Following Items in Addition to the Items for Low and Moderate Seismicity)			
	Seismic-Force-Resisting System			
11	C NC N/A U	DEFLECTION COMPATIBILITY FOR RIGID DIAPHRAGMS: Secondary components have the shear capacity to develop the flexural strength of the components.	5.5.2.5.2	A.3.1.6.2
12	C NC N/A U	WALL OPENINGS: The total width of openings along any perimeter wall line constitutes less than 75% of the length of any perimeter wall when the wall piers have aspect ratios of less than 2-to-1.	5.5.3.3.1	A.3.2.3.3
	Diaphragms			
13	C NC N/A U	CROSS TIES IN FLEXIBLE DIAPHRAGMS: There are continuous cross ties between diaphragm chords.	5.6.1.2	A.4.1.2
14	C NC N/A U	STRAIGHT SHEATHING: All straight-sheathed diaphragms have aspect ratios less than 2-to-1 in the direction being considered.	5.6.2	A.4.2.1
15	C NC N/A U	SPANS: All wood diaphragms with spans greater than 24 ft (7.3 m) consist of wood structural panels or diagonal sheathing.	5.6.2	A.4.2.2
16	C NC N/A U	DIAGONALLY SHEATHED AND UNBLOCKED DIAPHRAGMS: All diagonally sheathed or unblocked wood structural panel diaphragms have horizontal spans less than 40 ft (12.2 m) and aspect ratios less than or equal to 4-to-1.	5.6.2	A.4.2.3
17	C NC N/A U	OTHER DIAPHRAGMS: Diaphragms do not consist of a system other than wood, metal deck, concrete, or horizontal bracing.	5.6.5	A.4.7.1
	Connections			
18	C NC N/A U	MINIMUM NUMBER OF WALL ANCHORS PER PANEL: There are at least two anchors connecting each precast wall panel to the diaphragm elements.	5.7.1.4	A.5.1.3
19	C NC N/A U	PRECAST WALL PANELS: Precast wall panels are connected to the foundation.	5.7.3.4	A.5.3.6
20	C NC N/A U	UPLIFT AT PILE CAPS: Pile caps have top reinforcement, and piles are anchored to the pile caps.	5.7.3.5	A.5.3.8

continues

Table 17-28 *(Continued)*. Collapse Prevention Structural Checklist for Building Types PC1 and PC1a

	Status	Evaluation Statement	Tier 2 Reference	Commentary Reference
21	C NC N/A U	GIRDERS: Girders supported by walls or pilasters have at least two ties securing the anchor bolts unless provided with independent stiff wall anchors with strength to resist the connection force calculated in the Quick Check procedure of Section 4.4.3.7.	5.7.4.2	A.5.4.2

Note: C = Compliant, NC = Noncompliant, N/A = Not Applicable, and U = Unknown.

C-6 Table 17-34 Collapse Prevention Structural Checklist for Building Type RM1 and RM2

Table 17-34. Collapse Prevention Structural Checklist for Building Types RM1 and RM2

	Status	Evaluation Statement	Tier 2 Reference	Commentary Reference
		Low and Moderate Seismicity		
		Seismic-Force-Resisting System		
01	C NC N/A U	REDUNDANCY: The number of lines of shear walls in each principal direction is greater than or equal to 2.	5.5.1.1	A.3.2.1.1
02	C NC N/A U	SHEAR STRESS CHECK: The shear stress in the reinforced masonry shear walls, calculated using the Quick Check procedure of Section 4.4.3.3, is less than 70 lb/in.^{2} (0.48 MPa).	5.5.3.1.1	A.3.2.4.1
03	C NC N/A U	REINFORCING STEEL: The total vertical and horizontal reinforcing steel ratio in reinforced masonry walls is greater than 0.002 of the wall with the minimum of 0.0007 in either of the two directions; the spacing of reinforcing steel is less than 48 in. (1220 mm), and all vertical bars extend to the top of the walls.	5.5.3.1.3	A.3.2.4.2
04	**Stiff Diaphragms**			
	C NC N/A U	TOPPING SLAB: Precast concrete diaphragm elements are interconnected by a continuous reinforced concrete topping slab.	5.6.4	A.4.5.1
	Connections			
05	C NC N/A U	WALL ANCHORAGE: Exterior concrete or masonry walls that are dependent on the diaphragm for lateral support are anchored for out-of-plane forces at each diaphragm level with steel anchors, reinforcing dowels, or straps that are developed into the diaphragm. Connections have strength to resist the connection force calculated in the Quick Check procedure of Section 4.4.3.7.	5.7.1.1	A.5.1.1
06	C NC N/A U	WOOD LEDGERS: The connection between the wall panels and the diaphragm does not induce cross-grain bending or tension in the wood ledgers.	5.7.1.3	A.5.1.2
07	C NC N/A U	TRANSFER TO SHEAR WALLS: Diaphragms are connected for transfer of seismic forces to the shear walls.	5.7.2	A.5.2.1
08	C NC N/A U	TOPPING SLAB TO WALLS OR FRAMES: Reinforced concrete topping slabs that interconnect the precast concrete diaphragm elements are doweled for transfer of forces into the shear wall or frame elements.	5.7.2	A.5.2.3
09	C NC N/A U	FOUNDATION DOWELS: Wall reinforcement is doweled into the foundation.	5.7.3.4	A.5.3.5
10	C NC N/A U	GIRDER–COLUMN CONNECTION: There is a positive connection using plates, connection hardware, or straps between the girder and the column support.	5.7.4.1	A.5.4.1
	High Seismicity (Complete the Following Items in Addition to the Items for Low and Moderate Seismicity)			
	Stiff Diaphragms			
11	C NC N/A U	OPENINGS AT SHEAR WALLS: Diaphragm openings immediately adjacent to the shear walls are less than 25% of the wall length.	5.6.1.3	A.4.1.4
12	C NC N/A U	OPENINGS AT EXTERIOR MASONRY SHEAR WALLS: Diaphragm openings immediately adjacent to exterior masonry shear walls are not greater than 8 ft (2.4 m) long.	5.6.1.3	A.4.1.6
	Flexible Diaphragms			
13	C NC N/A U	CROSS TIES: There are continuous cross ties between diaphragm chords.	5.6.1.2	A.4.1.2
14	C NC N/A U	OPENINGS AT SHEAR WALLS: Diaphragm openings immediately adjacent to the shear walls are less than 25% of the wall length.	5.6.1.3	A.4.1.4
15	C NC N/A U	OPENINGS AT EXTERIOR MASONRY SHEAR WALLS: Diaphragm openings immediately adjacent to exterior masonry shear walls are not greater than 8 ft (2.4 m) long.	5.6.1.3	A.4.1.6
16	C NC N/A U	STRAIGHT SHEATHING: All straight-sheathed diaphragms have aspect ratios less than 2-to-1 in the direction being considered.	5.6.2	A.4.2.1
17	C NC N/A U	SPANS: All wood diaphragms with spans greater than 24 ft (7.3 m) consist of wood structural panels or diagonal sheathing.	5.6.2	A.4.2.2
18	C NC N/A U	DIAGONALLY SHEATHED AND UNBLOCKED DIAPHRAGMS: All diagonally sheathed or unblocked wood structural panel diaphragms have horizontal spans less than 40 ft (12.2 m) and aspect ratios less than or equal to 4-to-1.	5.6.2	A.4.2.3
19	C NC N/A U	OTHER DIAPHRAGMS: Diaphragms do not consist of a system other than wood, metal deck, concrete, or horizontal bracing.	5.6.5	A.4.7.1
	Connections			
20	C NC N/A U	STIFFNESS OF WALL ANCHORS: Anchors of concrete or masonry walls to wood structural elements are installed taut and are stiff enough to limit the relative movement between the wall and the diaphragm to no greater than 1/8 in. (3 mm) before engagement of the anchors.	5.7.1.2	A.5.1.4

Note: C = Compliant, NC = Noncompliant, N/A = Not Applicable, and U = Unknown.

C-7 TABLE 17-38 NONSTRUCTURAL CHECKLIST

Table 17-38. Nonstructural Checklist

	Status	Evaluation Statement[a,b]	Tier 2 Reference	Commentary Reference
		Life Safety Systems		
01	C NC N/A U	**HR—not required; LS—LMH; PR—LMH**. FIRE SUPPRESSION PIPING: Fire suppression piping is anchored and braced in accordance with NFPA-13.	13.7.4	A.7.13.1
02	C NC N/A U	**HR—not required; LS—LMH; PR—LMH**. FLEXIBLE COUPLINGS: Fire suppression piping has flexible couplings in accordance with NFPA-13.	13.7.4	A.7.13.2
03	C NC N/A U	**HR—not required; LS—LMH; PR—LMH**. EMERGENCY POWER: Equipment used to power or control Life Safety systems is anchored or braced.	13.7.7	A.7.12.1
04	C NC N/A U	**HR—not required; LS—LMH; PR—LMH**. STAIR AND SMOKE DUCTS: Stair pressurization and smoke control ducts are braced and have flexible connections at seismic joints.	13.7.6	A.7.14.1
05	C NC N/A U	**HR—not required; LS—MH; PR—MH**. SPRINKLER CEILING CLEARANCE: Penetrations through panelized ceilings for fire suppression devices provide clearances in accordance with NFPA-13.	13.7.4	A.7.13.3
06	C NC N/A U	**HR—not required; LS—not required; PR—LMH**. EMERGENCY LIGHTING: Emergency and egress lighting equipment is anchored or braced.	13.7.9	A.7.3.1
		Hazardous Materials		
07	C NC N/A U	**HR—LMH; LS—LMH; PR—LMH**. HAZARDOUS MATERIAL EQUIPMENT: Equipment mounted on vibration isolators and containing hazardous material is equipped with restraints or snubbers.	13.7.1	A.7.12.2
08	C NC N/A U	**HR—LMH; LS—LMH; PR—LMH**. HAZARDOUS MATERIAL STORAGE: Breakable containers that hold hazardous material, including gas cylinders, are restrained by latched doors, shelf lips, wires, or other methods.	13.8.3	A.7.15.1
09	C NC N/A U	**HR—MH; LS—MH; PR—MH**. HAZARDOUS MATERIAL DISTRIBUTION: Piping or ductwork conveying hazardous materials is braced or otherwise protected from damage that would allow hazardous material release.	13.7.3 13.7.5	A.7.13.4
10	C NC N/A U	**HR—MH; LS—MH; PR—MH**. SHUTOFF VALVES: Piping containing hazardous material, including natural gas, has shutoff valves or other devices to limit spills or leaks.	13.7.3 13.7.5	A.7.13.3
11	C NC N/A U	**HR—LMH; LS—LMH; PR—LMH**. FLEXIBLE COUPLINGS: Hazardous material ductwork and piping, including natural gas piping, have flexible couplings.	13.7.3 13.7.5	A.7.15.4
12	C NC N/A U	**HR—MH; LS—MH; PR—MH**. PIPING OR DUCTS CROSSING SEISMIC JOINTS: Piping or ductwork carrying hazardous material that either crosses seismic joints or isolation planes or is connected to independent structures has couplings or other details to accommodate the relative seismic displacements.	13.7.3 13.7.5 13.7.6	A.7.13.6
		Partitions		
13	C NC N/A U	**HR—LMH; LS—LMH; PR—LMH**. UNREINFORCED MASONRY: Unreinforced masonry or hollow-clay tile partitions are braced at a spacing of at most 10 ft (3.0 m) in Low or Moderate Seismicity, or at most 6 ft (1.8 m) in High Seismicity.	13.6.2	A.7.1.1
14	C NC N/A U	**HR—LMH; LS—LMH; PR—LMH**. HEAVY PARTITIONS SUPPORTED BY CEILINGS: The tops of masonry or hollow-clay tile partitions are not laterally supported by an integrated ceiling system.	13.6.2	A.7.2.1
15	C NC N/A U	**HR—not required; LS—MH; PR—MH**. DRIFT: Rigid cementitious partitions are detailed to accommodate the following drift ratios: in steel moment frame, concrete moment frame, and wood frame buildings, 0.02; in other buildings, 0.005.	13.6.2	A.7.1.2
16	C NC N/A U	**HR—not required; LS—not required; PR—MH**. LIGHT PARTITIONS SUPPORTED BY CEILINGS: The tops of gypsum board partitions are not laterally supported by an integrated ceiling system.	13.6.2	A.7.2.1
17	C NC N/A U	**HR—not required; LS—not required; PR—MH**. STRUCTURAL SEPARATIONS: Partitions that cross structural separations have seismic or control joints.	13.6.2	A.7.1.3

continues

Table 17-38 *(Continued)*. Nonstructural Checklist

	Status	Evaluation Statement[a,b]	Tier 2 Reference	Commentary Reference
18	C NC N/A U	**HR—not required; LS—not required; PR—MH**. TOPS: The tops of ceiling-high framed or panelized partitions have lateral bracing to the structure at a spacing equal to or less than 6 ft (1.8 m).	13.6.2	A.7.1.4
	Ceilings			
19	C NC N/A U	**HR—H; LS—MH; PR—LMH**. SUSPENDED LATH AND PLASTER: Suspended lath and plaster ceilings have attachments that resist seismic forces for every 12 ft^2 (1.1 m^2) of area.	13.6.4	A.7.2.3
20	C NC N/A U	**HR—not required; LS—MH; PR—LMH**. SUSPENDED GYPSUM BOARD: Suspended gypsum board ceilings have attachments that resist seismic forces for every 12 ft^2 (1.1 m^2) of area.	13.6.4	A.7.2.3
21	C NC N/A U	**HR—not required; LS—not required; PR—MH**. INTEGRATED CEILINGS: Integrated suspended ceilings with continuous areas greater than 144 ft^2 (13.4 m^2) and ceilings of smaller areas that are not surrounded by restraining partitions are laterally restrained at a spacing no greater than 12 ft (3.6 m) with members attached to the structure above. Each restraint location has a minimum of four diagonal wires and compression struts, or diagonal members capable of resisting compression.	13.6.4	A.7.2.2
22	C NC N/A U	**HR—not required; LS—not required; PR—MH**. EDGE CLEARANCE: The free edges of integrated suspended ceilings with continuous areas greater than 144 ft^2 (13.4 m^2) have clearances from the enclosing wall or partition of at least the following: in Moderate Seismicity, 1/2 in. (13 mm); in High Seismicity, 3/4 in. (19 mm).	13.6.4	A.7.2.4
23	C NC N/A U	**HR—not required; LS—not required; PR—MH**. CONTINUITY ACROSS STRUCTURE JOINTS: The ceiling system does not cross any seismic joint and is not attached to multiple independent structures.	13.6.4	A.7.2.5
24	C NC N/A U	**HR—not required; LS—not required; PR—H**. EDGE SUPPORT: The free edges of integrated suspended ceilings with continuous areas greater than 144 ft^2 (13.4 m^2) are supported by closure angles or channels not less than 2 in. (51 mm) wide.	13.6.4	A.7.2.6
25	C NC N/A U	**HR—not required; LS—not required; PR—H**. SEISMIC JOINTS: Acoustical tile or lay-in panel ceilings have seismic separation joints such that each continuous portion of the ceiling is no more than 2,500 ft^2 (232.3 m^2) and has a ratio of long-to-short dimension no more than 4-to-1.	13.6.4	A.7.2.7
	Light Fixtures			
26	C NC N/A U	**HR—not required; LS—MH; PR—MH**. INDEPENDENT SUPPORT: Light fixtures that weigh more per square foot than the ceiling they penetrate are supported independent of the grid ceiling suspension system by a minimum of two wires at diagonally opposite corners of each fixture.	13.6.4 13.7.9	A.7.3.2
27	C NC N/A U	**HR—not required; LS—not required; PR—H**. PENDANT SUPPORTS: Light fixtures on pendant supports are attached at a spacing equal to or less than 6 ft. Unbraced suspended fixtures are free to allow a 360-degree range of motion at an angle not less than 45 degrees from horizontal without contacting adjacent components. Alternatively, if rigidly supported and/or braced, they are free to move with the structure to which they are attached without damaging adjoining components. Additionally, the connection to the structure is capable of accommodating the movement without failure.	13.7.9	A.7.3.3
28	C NC N/A U	**HR—not required; LS—not required; PR—H**. LENS COVERS: Lens covers on light fixtures are attached with safety devices.	13.7.9	A.7.3.4
	Cladding and Glazing			
29	C NC N/A U	**HR—MH; LS—MH; PR—MH**. CLADDING ANCHORS: Cladding components weighing more than 10 lb/ft^2 (0.48 kN/m^2) are mechanically anchored to the structure at a spacing equal to or less than the following: for Life Safety in Moderate Seismicity, 6 ft (1.8 m); for Life Safety in High Seismicity and for Position Retention in any seismicity, 4 ft (1.2 m)	13.6.1	A.7.4.1

continues

Table 17-38 *(Continued)*. Nonstructural Checklist

	Status	Evaluation Statement[a,b]	Tier 2 Reference	Commentary Reference
30	C NC N/A U	**HR—not required; LS—MH; PR—MH**. CLADDING ISOLATION: For steel or concrete moment-frame buildings, panel connections are detailed to accommodate a story drift ratio by the use of rods attached to framing with oversize holes or slotted holes of at least the following: for Life Safety in Moderate Seismicity, 0.01; for Life Safety in High Seismicity and for Position Retention in any seismicity, 0.02, and the rods have a length-to-diameter ratio of 4.0 or less.	13.6.1	A.7.4.3
31	C NC N/A U	**HR—MH; LS—MH; PR—MH**. MULTI-STORY PANELS: For multi-story panels attached at more than one floor level, panel connections are detailed to accommodate a story drift ratio by the use of rods attached to framing with oversize holes or slotted holes of at least the following: for Life Safety in Moderate Seismicity, 0.01; for Life Safety in High Seismicity and for Position Retention in any seismicity, 0.02, and the rods have a length-to-diameter ratio of 4.0 or less.	13.6.1	A.7.4.4
32	C NC N/A U	**HR—not required; LS—MH; PR—MH**. THREADED RODS: Threaded rods for panel connections detailed to accommodate drift by bending of the rod have a length-to-diameter ratio greater than 0.06 times the story height in inches for Life Safety in Moderate Seismicity and 0.12 times the story height in inches for Life Safety in High Seismicity and Position Retention in any seismicity.	13.6.1	A.7.4.9
33	C NC N/A U	**HR—MH; LS—MH; PR—MH**. PANEL CONNECTIONS: Cladding panels are anchored out of plane with a minimum number of connections for each wall panel, as follows: for Life Safety in Moderate Seismicity, 2 connections; for Life Safety in High Seismicity and for Position Retention in any seismicity, 4 connections.	13.6.1.4	A.7.4.5
34	C NC N/A U	**HR—MH; LS—MH; PR—MH**. BEARING CONNECTIONS: Where bearing connections are used, there is a minimum of two bearing connections for each cladding panel.	13.6.1.4	A.7.4.6
35	C NC N/A U	**HR—MH; LS—MH; PR—MH**. INSERTS: Where concrete cladding components use inserts, the inserts have positive anchorage or are anchored to reinforcing steel.	13.6.1.4	A.7.4.7
36	C NC N/A U	**HR—not required; LS—MH; PR—MH**. OVERHEAD GLAZING: Glazing panes of any size in curtain walls and individual interior or exterior panes more than 16 ft^2 (1.5 m^2) in area are laminated annealed or laminated heat-strengthened glass and are detailed to remain in the frame when cracked.	13.6.1.5	A.7.4.8
	Masonry Veneer			
37	C NC N/A U	**HR—not required; LS—LMH; PR—LMH**. TIES: Masonry veneer is connected to the backup with corrosion-resistant ties. There is a minimum of one tie for every 2-2/3 ft^2 (0.25 m^2), and the ties have spacing no greater than the following: for Life Safety in Low or Moderate Seismicity, 36 in. (914 mm); for Life Safety in High Seismicity and for Position Retention in any seismicity, 24 in. (610 mm).	13.6.1.2	A.7.5.1
38	C NC N/A U	**HR—not required; LS—LMH; PR—LMH**. SHELF ANGLES: Masonry veneer is supported by shelf angles or other elements at each floor above the ground floor.	13.6.1.2	A.7.5.2
39	C NC N/A U	**HR—not required; LS—LMH; PR—LMH**. WEAKENED PLANES: Masonry veneer is anchored to the backup adjacent to weakened planes, such as at the locations of flashing.	13.6.1.2	A.7.5.3
40	C NC N/A U	**HR—LMH; LS—LMH; PR—LMH**. UNREINFORCED MASONRY BACKUP: There is no unreinforced masonry backup.	13.6.1.1 13.6.1.2	A.7.7.2
41	C NC N/A U	**HR—not required; LS—MH; PR—MH**. STUD TRACKS: For veneer with cold-formed steel stud backup, stud tracks are fastened to the structure at a spacing equal to or less than 24 in. (610 mm) on center.	13.6.1.1 13.6.1.2	A.7.6.1

continues

Table 17-38 *(Continued)*. Nonstructural Checklist

	Status	Evaluation Statement[a,b]	Tier 2 Reference	Commentary Reference
42	C NC N/A U	**HR—not required; LS—MH; PR—MH**. ANCHORAGE: For veneer with concrete block or masonry backup, the backup is positively anchored to the structure at a horizontal spacing equal to or less than 4 ft along the floors and roof.	13.6.1.1 13.6.1.2	A.7.7.1
43	C NC N/A U	**HR—not required; LS—not required; PR—MH**. WEEP HOLES: In veneer anchored to stud walls, the veneer has functioning weep holes and base flashing.	13.6.1.2	A.7.5.6
44	C NC N/A U	**HR—not required; LS—not required; PR—MH**. OPENINGS: For veneer with cold-formed-steel stud backup, steel studs frame window and door openings.	13.6.1.1 13.6.1.2	A.7.6.2
	Parapets, Cornices, Ornamentation, and Appendages			
45	C NC N/A U	**HR—LMH; LS—LMH; PR—LMH**. URM PARAPETS OR CORNICES: Laterally unsupported unreinforced masonry parapets or cornices have height-to-thickness ratios no greater than the following: for Life Safety in Low or Moderate Seismicity, 2.5; for Life Safety in High Seismicity and for Position Retention in any seismicity, 1.5.	13.6.5	A.7.8.1
46	C NC N/A U	**HR—not required; LS—LMH; PR—LMH**. CANOPIES: Canopies at building exits are anchored to the structure at a spacing no greater than the following: for Life Safety in Low or Moderate Seismicity, 10 ft (3.0 m); for Life Safety in High Seismicity and for Position Retention in any seismicity, 6 ft (1.8 m).	13.6.6	A.7.8.2
47	C NC N/A U	**HR—H; LS—MH; PR—LMH**. CONCRETE PARAPETS: Concrete parapets with height-to-thickness ratios greater than 2.5 have vertical reinforcement.	13.6.5	A.7.8.3
48	C NC N/A U	**HR—MH; LS—MH; PR—LMH**. APPENDAGES: Cornices, parapets, signs, and other ornamentation or appendages that extend above the highest point of anchorage to the structure or cantilever from components are reinforced and anchored to the structural system at a spacing equal to or less than 6 ft (1.8 m). This evaluation statement item does not apply to parapets or cornices covered by other evaluation statements.	13.6.6	A.7.8.4
	Masonry Chimneys			
49	C NC N/A U	**HR—LMH; LS—LMH; PR—LMH**. URM CHIMNEYS: Unreinforced masonry chimneys extend above the roof surface no more than the following: for Life Safety in Low or Moderate Seismicity, 3 times the least dimension of the chimney; for Life Safety in High Seismicity and for Position Retention in any seismicity, 2 times the least dimension of the chimney.	13.6.7	A.7.9.1
50	C NC N/A U	**HR—LMH; LS—LMH; PR—LMH**. ANCHORAGE: Masonry chimneys are anchored at each floor level, at the topmost ceiling level, and at the roof.	13.6.7	A.7.9.2
	Stairs			
51	C NC N/A U	**HR—not required; LS—LMH; PR—LMH**. STAIR ENCLOSURES: Hollow-clay tile or unreinforced masonry walls around stair enclosures are restrained out of plane and have height-to-thickness ratios not greater than the following: for Life Safety in Low or Moderate Seismicity, 15-to-1; for Life Safety in High Seismicity and for Position Retention in any seismicity, 12-to-1.	13.6.2 13.6.8	A.7.10.1
52	C NC N/A U	**HR—not required; LS—LMH; PR—LMH**. STAIR DETAILS: The connection between the stairs and the structure does not rely on post-installed anchors in concrete or masonry, and the stair details are capable of accommodating the drift calculated using the Quick Check procedure of Section 4.4.3.1 for moment-frame structures or 0.5 in. for all other structures without including any lateral stiffness contribution from the stairs.	13.6.8	A.7.10.2
	Contents and Furnishings			
53	C NC N/A U	**HR—LMH; LS—MH; PR—MH**. INDUSTRIAL STORAGE RACKS: Industrial storage racks or pallet racks more than 12 ft high meet the requirements of ANSI/RMI MH 16.1 as modified by ASCE 7, Chapter 15.	13.8.1	A.7.11.1

continues

Table 17-38 *(Continued)*. Nonstructural Checklist

	Status	Evaluation Statement[a,b]	Tier 2 Reference	Commentary Reference
54	C NC N/A U	**HR—not required; LS—H; PR—MH**. TALL NARROW CONTENTS: Contents more than 6 ft (1.8 m) high with a height-to-depth or height-to-width ratio greater than 3-to-1 are anchored to the structure or to each other.	13.8.2	A.7.11.2
55	C NC N/A U	**HR—not required; LS—H; PR—H**. FALL-PRONE CONTENTS: Equipment, stored items, or other contents weighing more than 20 lb (9.1 kg) whose center of mass is more than 4 ft (1.2 m) above the adjacent floor level are braced or otherwise restrained.	13.8.2	A.7.11.3
56	C NC N/A U	**HR—not required; LS—not required; PR—MH**. ACCESS FLOORS: Access floors more than 9 in. (229 mm) high are braced.	13.6.10	A.7.11.4
57	C NC N/A U	**HR—not required; LS—not required; PR—MH**. EQUIPMENT ON ACCESS FLOORS: Equipment and other contents supported by access floor systems are anchored or braced to the structure independent of the access floor.	13.7.7 13.6.10	A.7.11.5
58	C NC N/A U	**HR—not required; LS—not required; PR—H**. SUSPENDED CONTENTS: Items suspended without lateral bracing are free to swing from or move with the structure from which they are suspended without damaging themselves or adjoining components.	13.8.2	A.7.11.6
	Mechanical and Electrical Equipment			
59	C NC N/A U	**HR—not required; LS—H; PR—H**. FALL-PRONE EQUIPMENT: Equipment weighing more than 20 lb (9.1 kg) whose center of mass is more than 4 ft (1.2 m) above the adjacent floor level, and which is not in-line equipment, is braced.	13.7.1 13.7.7	A.7.12.4
60	C NC N/A U	**HR—not required; LS—H; PR—H**. IN-LINE EQUIPMENT: Equipment installed in line with a duct or piping system, with an operating weight more than 75 lb (34.0 kg), is supported and laterally braced independent of the duct or piping system.	13.7.1	A.7.12.5
61	C NC N/A U	**HR—not required; LS—H; PR—MH**. TALL NARROW EQUIPMENT: Equipment more than 6 ft (1.8 m) high with a height-to-depth or height-to-width ratio greater than 3-to-1 is anchored to the floor slab or adjacent structural walls.	13.7.1 13.7.7	A.7.12.6
62	C NC N/A U	**HR—not required; LS—not required; PR—MH**. MECHANICAL DOORS: Mechanically operated doors are detailed to operate at a story drift ratio of 0.01.	13.6.9	A.7.12.7
63	C NC N/A U	**HR—not required; LS—not required; PR—H**. SUSPENDED EQUIPMENT: Equipment suspended without lateral bracing is free to swing from or move with the structure from which it is suspended without damaging itself or adjoining components.	13.7.1 13.7.7	A.7.12.8
64	C NC N/A U	**HR—not required; LS—not required; PR—H**. VIBRATION ISOLATORS: Equipment mounted on vibration isolators is equipped with horizontal restraints or snubbers and with vertical restraints to resist overturning.	13.7.1	A.7.12.9
65	C NC N/A U	**HR—not required; LS—not required; PR—H**. HEAVY EQUIPMENT: Floor-supported or platform-supported equipment weighing more than 400 lb (181.4 kg) is anchored to the structure.	13.7.1 13.7.7	A.7.12.10
66	C NC N/A U	**HR—not required; LS—not required; PR—H**. ELECTRICAL EQUIPMENT: Electrical equipment is laterally braced to the structure.	13.7.7	A.7.12.11
67	C NC N/A U	**HR—not required; LS—not required; PR—H**. CONDUIT COUPLINGS: Conduit greater than 2.5 in. (64 mm) trade size that is attached to panels, cabinets, or other equipment and is subject to relative seismic displacement has flexible couplings or connections.	13.7.8	A.7.12.12
	Piping			
68	C NC N/A U	**HR—not required; LS—not required; PR—H**. FLEXIBLE COUPLINGS: Fluid and gas piping has flexible couplings.	13.7.3 13.7.5	A.7.13.2

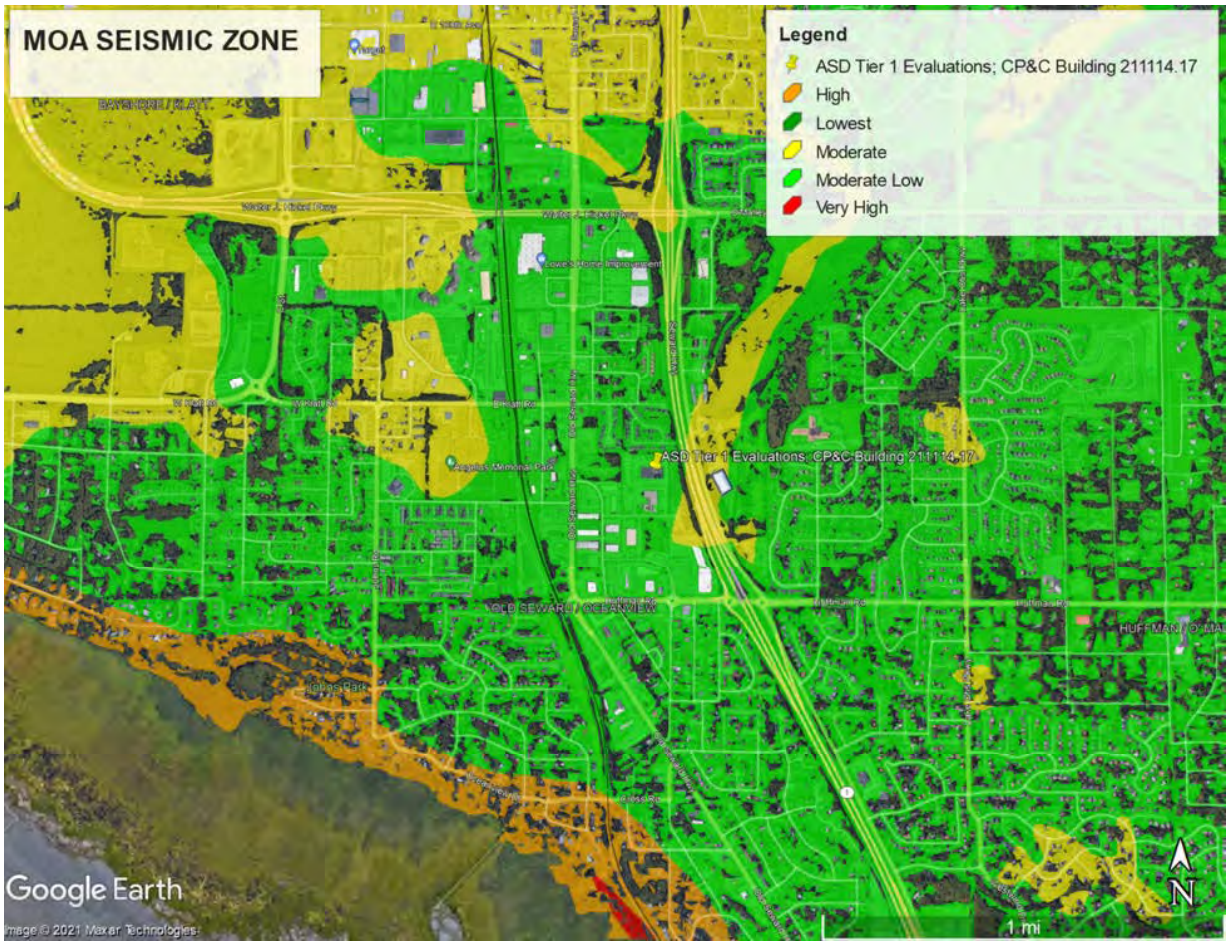
continues

Table 17-38 *(Continued)*. Nonstructural Checklist

	Status	Evaluation Statement[a,b]	Tier 2 Reference	Commentary Reference
69	C NC N/A U	**HR—not required; LS—not required; PR—H**. FLUID AND GAS PIPING: Fluid and gas piping is anchored and braced to the structure to limit spills or leaks.	13.7.3 13.7.5	A.7.13.4
70	C NC N/A U	**HR—not required; LS—not required; PR—H**. C-CLAMPS: One-sided C-clamps that support piping larger than 2.5 in. (64 mm) in diameter are restrained.	13.7.3 13.7.5	A.7.13.5
71	C NC N/A U	**HR—not required; LS—not required; PR—H**. PIPING CROSSING SEISMIC JOINTS: Piping that crosses seismic joints or isolation planes or is connected to independent structures has couplings or other details to accommodate the relative seismic displacements.	13.7.3 13.7.5	A.7.13.6
	Ducts			
72	C NC N/A U	**HR—not required; LS—not required; PR—H**. DUCT BRACING: Rectangular ductwork larger than 6 ft^2 (0.56 m^2) in cross-sectional area and round ducts larger than 28 in. (711 mm) in diameter are braced. The maximum spacing of transverse bracing does not exceed 30 ft (9.2 m). The maximum spacing of longitudinal bracing does not exceed 60 ft (18.3 m).	13.7.6	A.7.14.2
73	C NC N/A U	**HR—not required; LS—not required; PR—H**. DUCT SUPPORT: Ducts are not supported by piping or electrical conduit.	13.7.6	A.7.14.3
74	C NC N/A U	**HR—not required; LS—not required; PR—H**. DUCTS CROSSING SEISMIC JOINTS: Ducts that cross seismic joints or isolation planes or are connected to independent structures have couplings or other details to accommodate the relative seismic displacements.	13.7.6	A.7.14.4
	Elevators			
75	C NC N/A U	**HR—not required; LS—H; PR—H**. RETAINER GUARDS: Sheaves and drums have cable retainer guards.	13.7.11	A.7.16.1
76	C NC N/A U	**HR—not required; LS—H; PR—H**. RETAINER PLATE: A retainer plate is present at the top and bottom of both car and counterweight.	13.7.11	A.7.16.2
77	C NC N/A U	**HR—not required; LS—not required; PR—H**. ELEVATOR EQUIPMENT: Equipment, piping, and other components that are part of the elevator system are anchored.	13.7.11	A.7.16.3
78	C NC N/A U	**HR—not required; LS—not required; PR—H**. SEISMIC SWITCH: Elevators capable of operating at speeds of 150 ft/min (0.30 m/min) or faster are equipped with seismic switches that meet the requirements of ASME A17.1 or have trigger levels set to 20% of the acceleration of gravity at the base of the structure and 50% of the acceleration of gravity in other locations.	13.7.11	A.7.16.4
79	C NC N/A U	**HR—not required; LS—not required; PR—H**. SHAFT WALLS: Elevator shaft walls are anchored and reinforced to prevent toppling into the shaft during strong shaking.	13.7.11	A.7.16.5
80	C NC N/A U	**HR—not required; LS—not required; PR—H**. COUNTERWEIGHT RAILS: All counterweight rails and divider beams are sized in accordance with ASME A17.1.	13.7.11	A.7.16.6
81	C NC N/A U	**HR—not required; LS—not required; PR—H**. BRACKETS: The brackets that tie the car rails and the counterweight rail to the structure are sized in accordance with ASME A17.1.	13.7.11	A.7.16.7
82	C NC N/A U	**HR—not required; LS—not required; PR—H**. SPREADER BRACKET: Spreader brackets are not used to resist seismic forces.	13.7.11	A.7.16.8
83	C NC N/A U	**HR—not required; LS—not required; PR—H**. GO-SLOW ELEVATORS: The building has a go-slow elevator system.	13.7.11	A.7.16.9

Note: C = Compliant, NC = Noncompliant, N/A = Not Applicable, and U = Unknown.
[a] Performance Level: HR = Hazards Reduced, LS = Life Safety, and PR = Position Retention.
[b] Level of Seismicity: L = Low, M = Moderate, and H = High.

APPENDIX D — MUNICIPALITY OF ANCHORAGE SEISMIC HAZARD MAP



APPENDIX E — SUPPLEMENTAL CALCULATIONS

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Checked by: Date:

W2 "Quick Checks"

SHEAR STRESS CHECK

Mezz Average Height

$h_{nO} := 12\ ft$

4.4.2.4 Period. The fundamental period of a building, in the direction under consideration, shall be calculated in accordance with Eq. (4-4).

$$T = C_t h_n^{\beta} \quad (4\text{-}4)$$

where

T = Fundamental period (s) in the direction under consideration;
C_t = 0.035 for moment-resisting frame systems of steel (Building Types S1 and S1a);
= 0.018 for moment-resisting frames of reinforced concrete (Building Type C1);
= 0.030 for eccentrically braced steel frames (Building Types S2 and S2a);
= 0.020 for all other framing systems;
h_n = Height (ft) above the base to the roof level;

$C_t := \frac{.02}{ft}$ W2 **4.4.2.4**

β = 0.80 for moment-resisting frame systems of steel (Building Types S1 and S1a);
= 0.90 for moment-resisting frame systems of reinforced concrete (Building Type C1); and
= 0.75 for all other framing systems.

$\beta := .75$ W2 **4.4.2.4**

Alternatively, for steel or reinforced-concrete moment frames of 12 stories or fewer, the fundamental period of the building may be calculated as follows:

$$T = 0.10n \quad (4\text{-}5)$$

where n = number of stories above the base.

Original **EQN 4-4**

$T_O := C_t \cdot h_{nO}^{\beta} \cdot ft^{\frac{1}{4}} = 0.129$

4.4.2.3 Spectral Acceleration. Spectral acceleration, S_a, for use in computing the pseudo seismic force shall be computed in accordance with Eq. (4-3).

$$S_a = \frac{S_{X1}}{T} \quad (4\text{-}3)$$

but S_a shall not exceed S_{XS}, where T is the fundamental period of vibration of the building, calculated in accordance with Section 4.4.2.4, and S_{X1} and S_{XS} are as defined in Section 2.4 for the Seismic Hazard Level specified in Section 4.1.2. Alternatively, a site-specific response spectrum shall be permitted to be developed according to Section 2.4.2 for the Seismic Hazard Level specified in Section 4.1.2.

BSE-2E ATC HAZARD TOOL

$S_{xs} := 1.560$ $S_{x1} := 1.018$

Original **EQN 4-3**

$S_{aO} := min\left(S_{xs}, \frac{S_{x1}}{T_O}\right) = 1.56$

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W2 "Quick Checks"

WEIGHT OF STRUCTURE:

$FL := 9262\ ft^2$

$h_{nO} = 12\ ft$ Original Average

$\sigma_{Fl} := 25\ psf$

25 psf Floor Load

2x4 Int stud wall 8 psf

$W_{2x4} := 8.7857\ kip$

$\frac{h_{nO}}{2}$ *8 psf * Length of Wall

$W := FL \cdot (\sigma_{Fl}) + W_{2x4} = 240.336\ kip$

Weight Original

SEISMIC SHEAR:

Table 4-7. Modification Factor, *C*

Building Type[a]	Number of Stories 1	2	3	≥4
Wood and cold-formed steel shear wall (W1, W1a, W2, CFS1) Moment frame (S1, S3, C1, PC2a)	1.3	1.1	1.0	1.0
Shear wall (S4, S5, C2, C3, PC1a, PC2, RM2, URMa) Braced frame (S2) Cold-formed steel strap-brace wall (CFS2)	1.4	1.2	1.1	1.0
Unreinforced masonry (URM) Flexible diaphragms (S1a, S2a, S5a, C2a, C3a, PC1, RM1)	1.0	1.0	1.0	1.0

[a] Defined in Table 3-1.

$C_O := 1.3$ Original C **Table 4-7**

Mezz Weight **EQN 4-1**

$V_O := C_O \cdot S_{aO} \cdot W = 487.401\ kip$

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W2 "Quick Checks"

$k := 1$

4.4.2.2 Story Shear Forces. The pseudo seismic force calculated in accordance with Section 4.4.2.1 shall be distributed vertically in accordance with Eqs. (4-2a and 4-2b). For buildings six stories or fewer high, the value of k shall be permitted to be taken as 1.0.

$$F_x = \frac{w_x h_x^k}{\sum_{i=1}^{n} w_i h_i^k} V \qquad (4\text{-}2a)$$

$$V_j = \sum_{x=j}^{n} F_x \qquad (4\text{-}2b)$$

where

V_j = Story shear at story level j;
n = Total number of stories above ground level;
j = Number of story levels under consideration;
W = Total seismic weight, per Section 4.4.2.1;
V = Pseudo seismic force from Eq. (4-1);
w_i = Portion of total building weight W located on or assigned to floor level i;
w_x = Portion of total building weight W located on or assigned to floor level x;

h_i = Height (ft) from the base to floor level i;
h_x = Height (ft) from the base to floor level x; and
k = 1.0 for $T \le 0.5$ s and 2.0 for $T > 2.5$ s; linear interpolation shall be used for intermediate values of k.

For buildings with stiff or rigid diaphragms, the story shear forces shall be distributed to the lateral-force-resisting elements based on their relative rigidities. For buildings with flexible diaphragms (Types S1a, S2a, S5a, C2a, C3a, PC1, RM1, and URM), story shear shall be calculated separately for each line of lateral resistance.

Mezz Story Force **EQN 4-2a**

$$F_O := \frac{W \cdot {h_{nO}}^k}{W \cdot h_{nO}} \cdot V_O = 487.401\ kip$$

Mezz Story Shear **EQN 4-2b**

$$V_O := F_O = 487.401\ kip$$

$$V_G := \frac{2161.59\ ft^2}{FL} \cdot V_O = 113.751\ kip$$

$$V_9 := \frac{2505.15\ ft^2}{FL} \cdot V_O = 131.83\ kip$$

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W2 "Quick Checks"

4.4.3.3 Shear Stress in Shear Walls. The average shear stress in shear walls, v_j^{avg}, shall be calculated in accordance with Eq. (4-8).

$$v_j^{avg} = \frac{1}{M_s}\left(\frac{V_j}{A_w}\right) \quad (4\text{-}8)$$

where

V_j = Story shear at level j computed in accordance with Section 4.4.2.2;

A_w = Summation of the horizontal cross-sectional area of all shear walls in the direction of loading. Openings shall be taken into consideration where computing A_w. For masonry walls, the net area shall be used. For wood-framed walls, the length shall be used rather than the area; and

M_s = System modification factor; M_s shall be taken from Table 4-8.

Table 4-8. M_s Factors for Shear Walls

	Level of Performance		
Wall Type	**CP[a]**	**LS[a]**	**IO[a]**
Reinforced concrete, precast concrete, wood, reinforced masonry, and cold-formed steel	4.5	3.0	1.5
Unreinforced masonry	1.75	1.25	1.0

[a] CP = Collapse Prevention, LS = Life Safety, IO = Immediate Occupancy.

$$M_s := \frac{4.5+3.0}{2} = 3.75$$

$$v_G := \frac{1}{M_s}\cdot\left(\frac{V_G}{36.833\ ft}\right) = 823.543\ plf$$

< 1000 plf

PASS

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S2 & S2a "Quick Checks"

SHEAR STRESS CHECK

4.4.2.4 Period. The fundamental period of a building, in the direction under consideration, shall be calculated in accordance with Eq. (4-4).

$$T = C_t h_n^{\beta} \quad (4\text{-}4)$$

where

T = Fundamental period (s) in the direction under consideration;
C_t = 0.035 for moment-resisting frame systems of steel (Building Types S1 and S1a);
= 0.018 for moment-resisting frames of reinforced concrete (Building Type C1);
= 0.030 for eccentrically braced steel frames (Building Types S2 and S2a);
= 0.020 for all other framing systems;
h_n = Height (ft) above the base to the roof level;

β = 0.80 for moment-resisting frame systems of steel (Building Types S1 and S1a);
= 0.90 for moment-resisting frame systems of reinforced concrete (Building Type C1); and
= 0.75 for all other framing systems.

Alternatively, for steel or reinforced-concrete moment frames of 12 stories or fewer, the fundamental period of the building may be calculated as follows:

$$T = 0.10n \quad (4\text{-}5)$$

where n = number of stories above the base.

4.4.2.3 Spectral Acceleration. Spectral acceleration, S_a, for use in computing the pseudo seismic force shall be computed in accordance with Eq. (4-3).

$$S_a = \frac{S_{X1}}{T} \quad (4\text{-}3)$$

but S_a shall not exceed S_{XS}, where T is the fundamental period of vibration of the building, calculated in accordance with Section 4.4.2.4, and S_{X1} and S_{XS} are as defined in Section 2.4 for the Seismic Hazard Level specified in Section 4.1.2. Alternatively, a site-specific response spectrum shall be permitted to be developed according to Section 2.4.2 for the Seismic Hazard Level specified in Section 4.1.2.

233 & 233a Structure Average Height

$h_H := 42.5\ ft$

$C_t := \frac{.03}{ft}$ S2 & S2a **4.4.2.4**

$\beta := .75$ S2 & S2a **4.4.2.4**

Original **EQN 4-4**

$T_O := C_t \cdot h_H^{\beta} \cdot ft^{\frac{1}{4}} = 0.499$

BSE-2E ATC HAZARD TOOL

$S_{xs} := 1.562$ $S_{x1} := 1.018$

Original **EQN 4-3**

$S_{aO} := min\left(S_{xs}, \frac{S_{x1}}{T_O}\right) = 1.562$

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S2 & S2a "Quick Checks"

WEIGHT OF STRUCTURE: $\sigma_{SL} := 40\ psf \cdot .2 = 8\ psf$ 20% Snow Load

$RF_H := 3041\ ft^2$	$h_H = 42.5\ ft$	High Roof	$\sigma_{Rf} := 20\ psf$	Roof
$FL_3 := 800\ ft^2$	$h_3 := 33\ ft$	3rd Floor	$\sigma_m := 20\ psf$	Mezz
$RF_L := 37200\ ft^2$	$h_L := 27.5\ ft$	Low Roof	$\sigma_{mp} := 30\ psf$	Mezz & Partitions
$FL_{2cc} := 11200\ ft^2$	$h_2 := 13\ ft$	2nd Floor Concrete	$\sigma_7 := 7\ in \cdot 150\ pcf = 87.5\ psf$	7" Concrete Slab
$FL_{2mezz} := 2155\ ft^2 = 2155\ ft^2$		2nd Mezz	$\sigma_{mp} := 30\ psf$	Mezz & Partitions

8" CMU Grout 32" o.c. 50 psf

$W_8 := 516.3\ kip$ $\frac{h_L}{2}$ *50 psf * Length of Wall (751 ft)

7.5" Precast Concrete Wall 101.5 psf

$W_{10} := 1207\ kip$ $\frac{h_L}{2}$ *101.5 psf * Length of Wall (865 ft)

$$W := (RF_H + RF_L) \cdot (\sigma_{SL} + \sigma_{Rf}) + (FL_3 \cdot \sigma_m) + (FL_{2mezz} \cdot \sigma_{mp}) + (FL_{2cc} \cdot \sigma_7) + W_8 + W_{10} = 3910.698\ kip$$

Weight Building

SEISMIC SHEAR:

Table 4-7. Modification Factor, *C*

Building Type[a]	Number of Stories 1	2	3	≥4
Wood and cold-formed steel shear wall (W1, W1a, W2, CFS1) Moment frame (S1, S3, C1, PC2a)	1.3	1.1	1.0	1.0
Shear wall (S4, S5, C2, C3, PC1a, PC2, RM2, URMa) Braced frame (S2) Cold-formed steel strap-brace wall (CFS2)	1.4	1.2	1.1	1.0
Unreinforced masonry (URM) Flexible diaphragms (S1a, S2a, S5a, C2a, C3a, PC1, RM1)	1.0	1.0	1.0	1.0

[a] Defined in Table 3-1.

$C_O := 1.1$ Original C **Table 4-7**

Original Structure Weight **EQN 4-1**

$$V_O := C_O \cdot S_{aO} \cdot W = 6719.361\ kip$$

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S2 & S2a "Quick Checks"

$k := 1$

4.4.2.2 Story Shear Forces. The pseudo seismic force calculated in accordance with Section 4.4.2.1 shall be distributed vertically in accordance with Eqs. (4-2a and 4-2b). For buildings six stories or fewer high, the value of k shall be permitted to be taken as 1.0.

$$F_x = \frac{w_x h_x^k}{\sum_{i=1}^{n} w_i h_i^k} V \qquad (4\text{-}2a)$$

$$V_j = \sum_{x=j}^{n} F_x \qquad (4\text{-}2b)$$

where

V_j = Story shear at story level j;
n = Total number of stories above ground level;
j = Number of story levels under consideration;
W = Total seismic weight, per Section 4.4.2.1;
V = Pseudo seismic force from Eq. (4-1);
w_i = Portion of total building weight W located on or assigned to floor level i;
w_x = Portion of total building weight W located on or assigned to floor level x;

h_i = Height (ft) from the base to floor level i;
h_x = Height (ft) from the base to floor level x; and
k = 1.0 for $T \le 0.5$ s and 2.0 for $T > 2.5$ s; linear interpolation shall be used for intermediate values of k.

For buildings with stiff or rigid diaphragms, the story shear forces shall be distributed to the lateral-force-resisting elements based on their relative rigidities. For buildings with flexible diaphragms (Types S1a, S2a, S5a, C2a, C3a, PC1, RM1, and URM), story shear shall be calculated separately for each line of lateral resistance.

High Roof Story Force **EQN 4-2a**

$$F_{HR} := \frac{(RF_H \cdot (\sigma_{Rf} + \sigma_{SL}) \cdot h_H)}{((RF_H \cdot (\sigma_{SL} + \sigma_{Rf})) \cdot h_H) + (RF_L \cdot (\sigma_{SL} + \sigma_{Rf}) \cdot h_L) + (FL_3 \cdot \sigma_m \cdot h_3) + (((FL_{2mezz} \cdot \sigma_{mp}) + (FL_{2cc} \cdot \sigma_7)) \cdot h_2) + ((W_8 + W_{10}) \cdot h_L)} \cdot V_O = 259.337 \ \textbf{kip}$$

3rd Floor Story Force **EQN 4-2a**

$$F_3 := \frac{(FL_3 \cdot \sigma_m \cdot h_3)}{((RF_H \cdot (\sigma_{SL} + \sigma_{Rf})) \cdot h_H) + (RF_L \cdot (\sigma_{SL} + \sigma_{Rf}) \cdot h_L) + (FL_3 \cdot \sigma_m \cdot h_3) + (((FL_{2mezz} \cdot \sigma_{mp}) + (FL_{2cc} \cdot \sigma_7)) \cdot h_2) + ((W_8 + W_{10}) \cdot h_L)} \cdot V_O = 37.839 \ \textbf{kip}$$

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S2 & S2a "Quick Checks"

Low Roof Story Force **EQN 4-2a**

$$F_{LR} := \frac{(RF_L \cdot (\sigma_{SL} + \sigma_{Rf}) \cdot h_L) + ((W_8 + W_{10}) \cdot h_L)}{((RF_H \cdot (\sigma_{SL} + \sigma_{Rf})) \cdot h_H) + (RF_L \cdot (\sigma_{SL} + \sigma_{Rf}) \cdot h_L) + (FL_3 \cdot \sigma_m \cdot h_3) + (((FL_{2mezz} \cdot \sigma_{mp}) + (FL_{2cc} \cdot \sigma_7)) \cdot h_2) + ((W_8 + W_{10}) \cdot h_L)} \cdot V_O = 5448.956 \ kip$$

3rd Floor Story Force **EQN 4-2a**

$$F_2 := \frac{((FL_{2mezz} \cdot \sigma_{mp}) + (FL_{2cc} \cdot \sigma_7)) \cdot h_2)}{((RF_H \cdot (\sigma_{SL} + \sigma_{Rf})) \cdot h_H) + (RF_L \cdot (\sigma_{SL} + \sigma_{Rf}) \cdot h_L) + (FL_3 \cdot \sigma_m \cdot h_3) + (((FL_{2mezz} \cdot \sigma_{mp}) + (FL_{2cc} \cdot \sigma_7)) \cdot h_2) + ((W_8 + W_{10}) \cdot h_L)} \cdot V_O = 973.23 \ kip$$

$$V_{HR} := F_{HR} = 259.337 \ kip$$

$$V_3 := V_{HR} + F_3 = 297.176 \ kip$$

$$V_{LR} := V_3 + F_{LR} = 5746.132 \ kip$$

$$V_2 := V_{LR} + F_2 = 6719.361 \ kip$$

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S2 & S2a "Quick Checks"

COL AXIAL STRESS CHECK

4.4.3.6 Column Axial Stress Caused by Overturning. The axial stress of columns in moment frames at the base subjected to overturning forces, p_{ot}, shall be calculated in accordance with Eq. (4-11).

$$p_{ot} = \frac{1}{M_s}\left(\frac{2}{3}\right)\left(\frac{Vh_n}{Ln_f}\right)\left(\frac{1}{A_{col}}\right) \quad (4\text{-}11)$$

where

n_f = Total number of frames in the direction of loading;
V = Pseudo seismic force;

Table 4-9. M_s Factors for Diagonal Braces

Brace Type	d/t[b]	Level of Performance CP[a]	LS[a]	IO[a]
Tube[b]	$<90/(F_{ye})^{1/2}$	7.0	4.5	2.0
	$>190/(F_{ye})^{1/2}$	3.5	2.5	1.25
Pipe[c]	$<1{,}500/F_{ye}$	7.0	4.5	2.0
	$>6{,}000/F_{ye}$	3.5	2.5	1.25
Tension-only		3.5	2.5	1.25
Cold-formed steel strap-braced wall		3.5	2.5	1.25
All others		7.0	4.5	2.0

Note: $F_{ye} = 1.25F_y$; expected yield stress.
[a] CP = Collapse Prevention, LS = Life Safety, IO = Immediate Occupancy.
[b] Depth-to-thickness ratio.
[c] Interpolation to be used for tubes and pipes.

h_n = Height (ft) above the base to the roof level;
L = Total length of the frame (ft);
M_s = System modification factor taken as equal to 2.5 for buildings being evaluated to the Collapse Prevention Performance Level, equal to 1.5 for buildings being evaluated to the Life Safety Performance Level, and equal to 1.0 for buildings being evaluated to the Immediate Occupancy Performance Level; and
A_{col} = Area of the end column of the frame.

$F_y := 50\ ksi$

$M_s := \frac{2.5+1.5}{2} = 2$

$h_{max} := h_H = 42.5\ ft$

Longest BF Col
Max unbraced length

THE FOLLOWING FORCES ARE ONLY APPROXIMATIONS TO PROVIDE A GENERAL IDEA OF PERFORMANCE. RIGID DIAPHRAGM TRIBUTARY AREA WAS ESTIMATED USING FLEXIBLE DIAPHRAGM ASSUMPTIONS. ACTUAL FORCE MAY BE HIGHER!!!

W10x33 **GRID A**:

AISC 360 15th Edn $A_{10x33} := 9.71\ in^2$ $L_A := 17.5\ ft$ $n_A := 3$

$$V_A := \frac{1530\ ft^2}{RF_H}\cdot F_{HR} + \frac{400\ ft^2}{FL_3}\cdot F_3 + \frac{1530\ ft^2}{RF_L}\cdot F_{LR} + \frac{1530\ ft^2}{FL_{2cc}+FL_{2mezz}}\cdot F_2 = 485.005\ kip$$

$$p_{ot10x33} := \frac{1}{M_s}\cdot\frac{2}{3}\cdot\frac{V_A\cdot h_{max}}{L_A\cdot n_A}\cdot\frac{1}{A_{10x33}} = 13.478\ ksi \quad > .3\cdot F_y = 15\ ksi \quad \textbf{PASS}$$

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W10x49 **GRID 7**: $A_{10x49} := 14.4\ in^2$ $L_7 := 20\ ft$ $n_7 := 2$

$$TA_{HR} := \frac{3041.52\ ft^2}{2} = 1520.76\ ft^2 \qquad TA_{LR} := \frac{38.05\ ft^2}{.125 \cdot .125} = 2435.2\ ft^2$$

$$TA_{3rd} := 349\ ft^2 = 349\ ft^2 \qquad TA_{2nd} := \frac{34.84\ ft^2}{.125 \cdot .125} = 2229.76\ ft^2$$

$$V_7 := \frac{TA_{HR}}{RF_H} \cdot F_{HR} + \frac{TA_{3rd}}{FL_3} \cdot F_3 + \frac{TA_{LR}}{RF_L} \cdot F_{LR} + \frac{TA_{2nd}}{FL_{2cc} + FL_{2mezz}} \cdot F_2 = 665.39\ kip$$

$$p_{ot10x49} := \frac{1}{M_s} \cdot \frac{2}{3} \cdot \frac{V_7 \cdot h_{max}}{L_7 \cdot n_7} \cdot \frac{1}{A_{10x49}} = 16.365\ ksi \quad > .3 \cdot F_y = 15\ ksi \quad \textbf{FAIL}$$

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BRACE AXIAL STRESS & SLENDERNESS CHECK

4.4.3.4 Diagonal Bracing. The average axial stress in diagonal bracing elements, f_j^{avg}, shall be calculated in accordance with Eq. (4-9).

$$f_j^{avg} = \frac{1}{M_s}\left(\frac{V_j}{sN_{br}}\right)\left(\frac{L_{br}}{A_{br}}\right) \quad (4\text{-}9)$$

where

L_{br} = Average length of the braces (ft);
N_{br} = Number of braces in tension and compression if the braces are designed for compression, number of diagonal braces in tension if the braces are designed for tension only;
s = Average span length of braced spans (ft);
A_{br} = Average area of a diagonal brace (in.^{2});
V_j = Maximum story shear at each level (kip); and
M_s = System modification factor; M_s shall be taken from Table 4-9.

Table 4-9. M_s Factors for Diagonal Braces

Brace Type	d/t^b	Level of Performance CP[a]	LS[a]	IO[a]
Tube[b]	$<90/(F_{ye})^{1/2}$	7.0	4.5	2.0
	$>190/(F_{ye})^{1/2}$	3.5	2.5	1.25
Pipe[c]	$<1{,}500/F_{ye}$	7.0	4.5	2.0
	$>6{,}000/F_{ye}$	3.5	2.5	1.25
Tension-only		3.5	2.5	1.25
Cold-formed steel strap-braced wall		3.5	2.5	1.25
All others		7.0	4.5	2.0

Note: $F_{ye} = 1.25F_y$; expected yield stress.
[a] CP = Collapse Prevention, LS = Life Safety, IO = Immediate Occupancy.
[b] Depth-to-thickness ratio.
[c] Interpolation to be used for tubes and pipes.

$F_y := 46\ ksi$

$F_{ye} := 1.25 \cdot F_y = 57.5\ ksi$

$$LB := \frac{90}{\left(\frac{F_y}{ksi}\right)^{\frac{1}{2}}} = 13.27$$

$$UB := \frac{190}{\left(\frac{F_y}{ksi}\right)^{\frac{1}{2}}} = 28.014$$

$$M_{sLB} := \frac{7+4.5}{2} = 5.75$$

$$M_{sUB} := \frac{3.5+2.5}{2} = 3$$

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- HSS 6x6x1/4 **LINE 7 Base to 2nd Floor:**

$x := 22.8$ x = d/t **AISC 360 15th Edn**

$$M_{s6x4} := \begin{cases} M_{sLB} & \text{if } x < LB \\ M_{sUB} & \text{if } x > UB \\ \left(\frac{x - LB}{UB - LB} \cdot (M_{sUB} - M_{sLB})\right) + M_{sLB} & \text{otherwise} \end{cases} = 3.972$$

$h_2 = 13\ ft$

$A_{6x4} := 5.24\ in^2$

$V_7 = 665.39\ kip$

$s_{max} := 24.5\ ft$

$s_{min} := 20\ ft$

$n_7 = 2$

$L_{CD.2} := \sqrt{\left(\frac{s_{min}}{2}\right)^2 + h_2^2}$

$f_{6x6} := \frac{1}{M_{s6x4}} \cdot \frac{V_7}{s_{min} \cdot n_7} \cdot \frac{L_{CD.2}}{A_{6x4}} = 13.107\ ksi$ $> .5 \cdot F_y = 23\ ksi$ **PASS**

$$\frac{r_{6x4} := 2.34\ in}{\frac{\sqrt{\left(\frac{s_{max}}{2}\right)^2 + h_2^2}}{r_{6x4}}} = 91.602 \quad < 200$$ **PASS**

$V_{7L} := \frac{TA_{HR}}{RF_H} \cdot F_{HR} + \frac{TA_{3rd}}{FL_3} \cdot F_3 + \frac{TA_{LR}}{RF_L} \cdot F_{LR} = 502.899\ kip$

$V_{73} := \frac{TA_{HR}}{RF_H} \cdot F_{HR} + \frac{TA_{3rd}}{FL_3} \cdot F_3 = 146.198\ kip$

$V_{7H} := \frac{TA_{HR}}{RF_H} \cdot F_{HR} = 129.691\ kip$

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- HSS 6x6x3/16 **LINE 7 2nd to Low Roof:**

$x := 31.5$ x = d/t **AISC 360 15th Edn**

$$M_{s6x3} := \begin{cases} M_{sLB} & \text{if } x < LB \\ M_{sUB} & \text{if } x > UB \\ \left(\frac{x - LB}{UB - LB} \cdot (M_{sUB} - M_{sLB})\right) + M_{sLB} & \text{otherwise} \end{cases} = 3$$

$h_L = 27.5\ ft$

$h_2 = 13\ ft$

$A_{6x3} := 3.98\ in^2$

$V_{7L} = 502.899\ kip$

$s_{min} = 20\ ft$

$s_{max} = 24.5\ ft$

$n_7 = 2$

$$L_{7.2} := \sqrt{\left(\frac{s_{min}}{2}\right)^2 + (h_L - h_2)^2}$$

$$f_{6x3} := \frac{1}{M_{s6x3}} \cdot \frac{V_{7L}}{s_{min} \cdot n_7} \cdot \frac{L_7}{A_{6x3}} = 21.059\ ksi \quad > .5 \cdot F_y = 23\ ksi \quad \textbf{PASS}$$

$r_{6x3} := 2.37\ in$

$$\frac{\sqrt{(s_{max})^2 + (h_L - h_2)^2}}{r_{6x3}} = 144.148 \quad < 200 \quad \textbf{PASS}$$

$s_{max} := 22.5\ ft$

- HSS 6x6x1/2 **LINE D.2 2nd to Low Roof:**

$$L_{D.2} := \sqrt{\left(\frac{s_{min}}{2}\right)^2 + (h_L - h_2)^2}$$

$r_{6x8} := 2.23\ in$ $A_{6x8} := 9.74\ in^2$

$$\frac{\sqrt{(s_{max})^2 + (h_L - h_2)^2}}{r_{6x8}} = 144.04 \quad < 200$$

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- (2) L3x2.5x3/8 **LINE 7 Low Roof to 3rd Floor :** $F_y := 36\ ksi$

$M_s := M_{sLB} = 5.75$

$A_{2L36} := 3.86\ in^2$ $s_{min} = 20\ ft$ $h_H - h_3 = 9.5\ ft$

$V_{7H} = 129.691\ kip$ $s_{max} = 22.5\ ft$ $n_7 = 2$

$$L_{7.H} := \sqrt{\left(\frac{s_{min}}{2}\right)^2 + \left(h_3 - h_L\right)^2}$$

$$f_{6x6} := \frac{1}{M_s} \cdot \frac{V_{7H}}{s_{min} \cdot n_7} \cdot \frac{L_7}{A_{2L36}} = 2.922\ ksi \qquad > .5 \cdot F_y = 18\ ksi \qquad \textbf{PASS}$$

$r_{x2L36} := .924\ in$

$$\frac{\sqrt{\left(\frac{s_{max}}{2}\right)^2 + \left(h_3 - h_L\right)^2}}{r_{x2L36}} = 162.63 \qquad < 200 \qquad \textbf{PASS}$$

- (2) L3x2.5x1/4 **LINE 7 3rd Floor to High Roof:**

$r_{x2L34} := .94\ in$

$A_{2L34} := 2.64\ in^2$

$$\frac{\sqrt{\left(\frac{s_{max}}{2}\right)^2 + \left(h_H - h_3\right)^2}}{r_{x2L34}} = 187.973 \qquad < 200 \qquad \textbf{PASS}$$

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COMPACT MEMBERS & DUCTILITY CHECK

$E := 29000\ ksi$ $F_y := 46\ ksi$

$\lambda_p := 1.4 \cdot \sqrt{\frac{E}{F_y}} = 35.152$ AISC 360 15th Edition **Table B4.1**

$\lambda_{md} := 1.18 \cdot \sqrt{\frac{E}{1.4 \cdot F_y}} = 25.04$ AISC Seismic Design Manual 3rd Edition **Table D1.1**

HSS 6x6x1/4

$x := 22.8$ x = d/t **AISC 360 15th Edn** $< \lambda_{md} = 25.04$ $< \lambda_p = 35.152$ **PASS**

HSS 6x6x3/16

$x := 31.5$ x = d/t **AISC 360 15th Edn** $< \lambda_{md} = 25.04$ $< \lambda_p = 35.152$

HSS 6x6x1/2 **FAIL** **PASS**

$x := 9.90$ x = d/t **AISC 360 15th Edn** $< \lambda_{md} = 25.04$ $< \lambda_p = 35.152$

PASS **PASS**

$F_y := 36\ ksi$

$\lambda_p := .45 \cdot \sqrt{\frac{E}{F_y}} = 12.772$ AISC 360 15th Edition **Table B4.1**

$\lambda_{md} := .32 \cdot \sqrt{\frac{E}{1.5 \cdot F_y}} = 7.416$ AISC Seismic Design Manual 3rd Edition **Table D1.1**

(2) L3x2.5x1/4

$t := \frac{1}{4}\ in$ $b := 3\ in$

$x := \frac{b}{t} = 12$ x = b/t **AISC 360 15th Edn** $< \lambda_{md} = 7.416$ $< \lambda_p = 12.772$ **PASS**

FAIL

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(2) L3x2.5x3/8

$t := \frac{3}{8}\ in$ $b := 3\ in$

$x := \frac{b}{t} = 8$ x = b/t **AISC 360 15th Edn** $< \lambda_{md} = 7.416$ $< \lambda_p = 12.772$ **PASS**

FAIL

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BRACE CONNECTION BUCKLING STRENGTH

$F_y := 46\ ksi$

HSS 6x6x1/4

$\lambda_r := 1.4 \cdot \sqrt{\frac{E}{F_y}} = 35.152$ > $x := 22.8$ x = d/t **AISC 360 15th Edn**

NONSLENDER

HSS 6x6x3/16

>

$x := 31.5$ x = d/t **AISC 360 15th Edn**

NONSLENDER

HSS 6x6x1/2

>

$x := 9.90$ x = d/t **AISC 360 15th Edn**

NONSLENDER

$r_{6x4} := 2.34\ in$ $\frac{L_{CD.2}}{r_{6x4}} = 84.109$ < $4.71 \cdot \sqrt{\frac{E}{F_y}} = 118.261$

$r_{6x3} := 2.31\ in$ $\frac{L_{7.2}}{r_{6x3}} = 91.501$ < $4.71 \cdot \sqrt{\frac{E}{F_y}} = 118.261$

$r_{6x8} := 2.23\ in$ $\frac{L_{D.2}}{r_{6x8}} = 94.783$ < $4.71 \cdot \sqrt{\frac{E}{F_y}} = 118.261$

$F_{e6x4} := \frac{\pi^2 \cdot E}{\left(\frac{L_{CD.2}}{r_{6x4}}\right)^2} = 40.459\ ksi$ $F_{e6x3} := \frac{\pi^2 \cdot E}{\left(\frac{L_{7.2}}{r_{6x3}}\right)^2} = 34.186\ ksi$ $F_{e6x8} := \frac{\pi^2 \cdot E}{\left(\frac{L_{D.2}}{r_{6x8}}\right)^2} = 31.859\ ksi$

HSS 6x6x1/4 Buckling Capacity AISC 360 **Eqn E3-4**

$P_{6x4} := \left(.658^{\frac{F_y}{F_{e6x4}}}\right) \cdot F_y \cdot A_{6x4} = 149.768\ kip$

AISC 360 **Eqn E3-1 (E3-2)**

HSS 6x6x5/16 Buckling Capacity

$P_{6x3} := \left(.658^{\frac{F_y}{F_{e6x3}}}\right) \cdot F_y \cdot A_{6x3} = 104.243\ kip$

AISC 360 **Eqn E3-1 (E3-2)**

HSS 6x6x5/16 Buckling Capacity

$P_{6x8} := \left(.658^{\frac{F_y}{F_{e6x8}}}\right) \cdot F_y \cdot A_{6x8} = 244.828\ kip$ AISC 360 **Eqn E3-1 (E3-2)**

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$l_{weld} := 8\ in$ $D := 5$ Gusset to Brace

$$\frac{P_{6x4}}{4 \cdot 1.392\ \frac{kip}{in} \cdot D} = 4.035\ in \quad < \quad l_{weld} = 8\ in$$ ASSUMED **PASS**

AISC **EQN 8-2a**

$$\frac{P_{6x3}}{4 \cdot 1.392\ \frac{kip}{in} \cdot D} = 2.808\ in \quad < \quad l_{weld} = 8\ in$$ ASSUMED **PASS**

AISC **EQN 8-2a**

$$\frac{P_{6x8}}{4 \cdot 1.392\ \frac{kip}{in} \cdot D} = 6.596\ in \quad < \quad l_{weld} = 8\ in$$ ASSUMED **PASS**

AISC **EQN 8-2a**

$c := 1\ in$ ASUMMED Distance of Beam to Brace

$t_{pHSS} := \frac{1}{2}\ in = 0.5\ in$ Thickness of Gusset

$\theta_{HSS} := \operatorname{atan}\left(\frac{h_2}{\frac{s_{max}}{2}}\right) = 49.128\ deg$ Angle of Brace

$l_1 := \frac{c}{\sin(\theta_{HSS})} = 1.322\ in$

$t_\beta := 1.5 \cdot \sqrt{\frac{36\ ksi \cdot c^3}{E \cdot l_1}} = 0.046\ in \quad < \quad t_{pHSS} = 0.5\ in$ Non-compact Buckling Controls

$l_{wHSS} := \tan(\theta_{HSS}) \cdot 6\ in = 0.578\ ft$ Whitmore Section

$r := \frac{t_{pHSS}}{\sqrt{12}} = 0.144\ in$ Plate Radius of Gyration

$\frac{l_1}{r} = 9.162 \quad < \quad 4.71 \cdot \sqrt{\frac{E}{36\ ksi}} = 133.681$ AISC 360 E3-2

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$$F_e := \frac{\pi^2 \cdot E}{\left(\frac{l_1}{r}\right)^2} = 3409.525\ ksi$$ AISC 360 Eqn E3-4

FAIL

$$P := \left(.658^{\left(\frac{36\ ksi}{F_e}\right)}\right) \cdot 36\ ksi \cdot l_{wHSS} \cdot t_{pHSS} = 124.25\ kip \quad < \quad P_c := \max\left(P_{6x4}, P_{6x3}, P_{6x8}\right) = 244.828\ kip$$

AISC 360 Eqn E3-1 (E3-2)

$b := 3\ in$ $F_y := 36\ ksi$

(2) L3x2.5x1/4 $t := \frac{1}{4}\ in$

$\lambda_r := .45 \cdot \sqrt{\frac{E}{F_y}} = 12.772$ > $x := \frac{b}{t} = 12$ x = d/t **AISC 360 15th Edn**

NONSLENDER

(2) L3x2.5x1/4 $t := \frac{3}{8}\ in$

>

$x := \frac{b}{t} = 8$ x = d/t **AISC 360 15th Edn**

NONSLENDER

$$L_{7.3} := \sqrt{\left(\frac{s_{min}}{2}\right)^2 + \left(h_3 - h_L\right)^2}$$

$r_{x2L36} = 0.924\ in$ $\frac{L_{7.3}}{r_{x2L36}} = 148.217$ > $4.71 \cdot \sqrt{\frac{E}{F_y}} = 133.681$

$r_{x2L34} = 0.94\ in$ $\frac{L_{7.H}}{r_{x2L34}} = 145.694$ > $4.71 \cdot \sqrt{\frac{E}{F_y}} = 133.681$

$$F_{ef2L36} := \frac{\pi^2 \cdot E}{\left(\frac{L_{7.3}}{r_{x2L36}}\right)^2} = 13.029\ ksi$$ AISC 360 Eqn E3-4

$$F_{ef2L34} := \frac{\pi^2 \cdot E}{\left(\frac{L_{7.H}}{r_{x2L34}}\right)^2} = 13.484\ ksi$$ AISC 360 Eqn E3-4

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$r_{x2L34} = 0.94\ in$ $r_{y2L34} := 1.12\ in$ $r_{o2L34} := 1.66\ in$ $H_{2L34} := .781$

$r_{x2L36} = 0.924\ in$ $r_{y2L36} := 1.15\ in$ $r_{o2L36} := 1.66\ in$ $H_{2L36} := .79$

$G := 11200\ ksi$ $C_{w2L34} := .0161\ in^6$ $J_{2L34} := .0296\ in^4$

$C_{w2L36} := .0507\ in^6$ $J_{2L36} := .0934\ in^4$

$$F_{ex2L34} := \frac{\pi^2 \cdot E}{\left(\frac{L_{7.H}}{r_{x2L34}}\right)^2} \quad F_{ey2L34} := \frac{\pi^2 \cdot E}{\left(\frac{L_{7.H}}{r_{y2L34}}\right)^2} \quad F_{ey2L36} := \frac{\pi^2 \cdot E}{\left(\frac{L_{7.H}}{r_{y2L34}}\right)^2} \quad F_{ex2L36} := \frac{\pi^2 \cdot E}{\left(\frac{L_{7.H}}{r_{x2L34}}\right)^2}$$

$$F_{ez2L34} := \left(\frac{\pi^2 \cdot C_{w2L34} \cdot E}{(L_{7.H})^2} + G \cdot J_{2L34}\right) \cdot \frac{1}{A_{2L34} \cdot r_{o2L34}^2} = 45.605\ ksi$$ AISC 360 **Eqn E4-7**

$$F_{ez2L36} := \left(\frac{\pi^2 \cdot C_{w2L36} \cdot E}{(L_{7.3})^2} + G \cdot J_{2L36}\right) \cdot \frac{1}{A_{2L36} \cdot r_{o2L36}^2} = 98.42\ ksi$$ AISC 360 **Eqn E4-7**

$$F_{et2L34} := \frac{F_{ey2L34} + F_{ez2L34}}{2 \cdot H_{2L34}} \cdot \left(1 - \sqrt{1 - \frac{4 \cdot F_{ey2L34} \cdot F_{ez2L34} \cdot H_{2L34}}{(F_{ey2L34} + F_{ez2L34})^2}}\right) = 16.947\ ksi$$

AISC 360 **Eqn E4-3**

$$F_{et2L36} := \frac{F_{ey2L36} + F_{ez2L36}}{2 \cdot H_{2L36}} \cdot \left(1 - \sqrt{1 - \frac{4 \cdot F_{ey2L36} \cdot F_{ez2L36} \cdot H_{2L36}}{(F_{ey2L36} + F_{ez2L36})^2}}\right) = 18.268\ ksi$$

AISC 360 **Eqn E4-3**

(2) L3x2.5x1/4 Flexural Buckling Capacity $min\left(F_{ef2L34}, F_{et2L34}\right)$

$P_{2L34} := .877 \cdot min\left(F_{ef2L34}, F_{et2L34}\right) \cdot A_{2L34} = 31.219\ kip$ AISC 360 **Eqn E3-3**

(2) L3x2.5x3/8 Flexural Buckling Capacity

$P_{2L36} := .877 \cdot min\left(F_{ef2L36}, F_{et2L36}\right) \cdot A_{2L36} = 44.105\ kip$ AISC 360 **Eqn E3-3**

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(2) 3/4" A325 Bolts DBL Shear

$F_{nv} := \frac{45.1}{.75}\ kip = 60.133\ kip$ Gusset to Brace AISC 360 Table 7-1

$P_{2L34} = 31.219\ kip$ < $2 \cdot F_{nv} = 120.267\ kip$ **PASS** FOR 3/8" PL BOLT SHEAR GOVERNS

$P_{2L36} = 44.105\ kip$ < $2 \cdot F_{nv} = 120.267\ kip$ **PASS** FOR 3/8" PL BOLT SHEAR GOVERNS

$c := 1\ in$ ASUMMED Distance of Beam to Brace

$t_{pL} := \frac{3}{8}\ in = 0.375\ in$ Thickness of Gusset

$\theta_L := \operatorname{atan}\left(\frac{h_H - h_3}{\frac{s_{max}}{2}}\right) = 40.179\ deg$ Angle of Brace

$l_1 := \frac{c}{\sin(\theta_L)} = 1.55\ in$

$t_\beta := 1.5 \cdot \sqrt{\frac{36\ ksi \cdot c^3}{E \cdot l_1}} = 0.042\ in$ < $t_{pL} = 0.375\ in$ Non-compact Buckling Controls

$l_{wL} := \tan(\theta_L) \cdot 6\ in = 0.422\ ft$ Whitmore Section

$r := \frac{t_{pL}}{\sqrt{12}} = 0.108\ in$ Plate Radius of Gyration

$\frac{l_1}{r} = 14.318$ < $4.71 \cdot \sqrt{\frac{E}{36\ ksi}} = 133.681$ AISC 360 E3-2

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S2 & S2a "Quick Checks"

$$F_e := \frac{\pi^2 \cdot E}{\left(\frac{l_1}{r}\right)^2} = 1396.182\ ksi$$

AISC 360 Eqn E3-4

PASS

$$P := \left(.658^{\frac{36\ ksi}{F_e}}\right) \cdot 36\ ksi \cdot l_{wL} \cdot t_{pL} = 67.666\ kip \quad > \quad P_c := \max\left(P_{2L34}, P_{2L36}\right) = 44.105\ kip$$

AISC 360 Eqn E3-1 (E3-2)

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BRACE CONNECTION YEILDING STRENGTH

$F_y := 46\ ksi$

$P_{6x4} := F_y \cdot A_{6x4} = 188.64\ kip$ HSS6x6x1/4 Yield Capacity AISC 360 Eqn D2-1

$P_{6x3} := F_y \cdot A_{6x3} = 183.08\ kip$ HSS6x6x3/16 Yield Capacity AISC 360 Eqn D2-1

$P_{6x8} := F_y \cdot A_{6x8} = 448.04\ kip$ HSS6x6x1/2 Yield Capacity AISC 360 Eqn D2-1

FAIL

$P := l_{wHSS} \cdot t_{pHSS} \cdot F_y = 159.467\ kip$ < $P_t := \max(P_{6x4}, P_{6x3}) = 241.04\ kip$

Plate Yield Capacity AISC 360 Eqn D2-1 $\frac{P}{P_{6x4}} = 0.662$ $\frac{P}{P_{6x3}} = 0.871$

$\frac{P_{6x4}}{4 \cdot 1.392 \frac{kip}{in} \cdot D} = 6.494\ in$ < l_{weld} PASS

.75

AISC EQN 8-2a

$\frac{P_{6x3}}{4 \cdot 1.392 \frac{kip}{in} \cdot D} = 4.932\ in$ < l_{weld} PASS

.75

AISC EQN 8-2a

$\frac{P_{6x8}}{4 \cdot 1.392 \frac{kip}{in} \cdot D} = 12.07\ in$ < $l_{weld} = 8\ in$ FAIL

.75

AISC EQN 8-2a

$P_{HSS} := P_t \cdot \sin(\theta_{HSS}) - P_c \cdot \sin(\theta_{HSS}) = 148.916\ kip$ FAIL SEE ENERCALC BEAM CHECK

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$P_{2L34} := F_y \cdot A_{2L34} = 121.44\ kip$ (2) L3x2.5x1/4 Yield Capacity AISC 360 **Eqn D2-1**

$P_{2L36} := F_y \cdot A_{2L36} = 177.56\ kip$ (2) L3x2.5x1/4 Yield Capacity AISC 360 **Eqn D2-1**

$F_y := 36\ ksi$

$P_w := l_{wL} \cdot t_{pL} \cdot F_y = 68.4\ kip$ < $P_t := \max(P_{2L34}, P_{2L36}) = 177.56\ kip$

FAIL

$P_b := F_{nv} \cdot 2 = 120.267\ kip$ < $P_t := \max(P_{2L34}, P_{2L36}) = 177.56\ kip$

Bolt Failure FAIL $\frac{min(P_w, P_b)}{P_{2L36}} = 0.385$ $\frac{min(P_w, P_b)}{P_{2L34}} = 0.563$

$P_L := P_t \cdot \sin(\theta_L) - P_c \cdot \sin(\theta_L) = 86.103\ kip$ FAIL **SEE ENERCALC BEAM CHECK**

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PC1 & PC1a "Quick Checks"

4.4.3.3 Shear Stress in Shear Walls. The average shear stress in shear walls, v_j^{avg}, shall be calculated in accordance with Eq. (4-8).

$$v_j^{avg} = \frac{1}{M_s}\left(\frac{V_j}{A_w}\right) \quad (4\text{-}8)$$

where

V_j = Story shear at level j computed in accordance with Section 4.4.2.2;
A_w = Summation of the horizontal cross-sectional area of all shear walls in the direction of loading. Openings shall be taken into consideration where computing A_w. For masonry walls, the net area shall be used. For wood-framed walls, the length shall be used rather than the area; and
M_s = System modification factor; M_s shall be taken from Table 4-8.

Table 4-8. M_s Factors for Shear Walls

	Level of Performance		
Wall Type	**CP[a]**	**LS[a]**	**IO[a]**
Reinforced concrete, precast concrete, wood, reinforced masonry, and cold-formed steel	4.5	3.0	1.5
Unreinforced masonry	1.75	1.25	1.0

[a] CP = Collapse Prevention, LS = Life Safety, IO = Immediate Occupancy.

$$M_s := \frac{4.5+3.0}{2} = 3.75$$

THE FOLLOWING FORCES ARE ONLY APPROXIMATIONS TO PROVIDE A GENERAL IDEA OF PERFORMANCE. RIGID DIAPHRAGM TRIBUTARY AREA WAS ESTIMATED USING FLEXIBLE DIAPHRAGM ASSUMPTIONS. ACTUAL FORCE MAY BE HIGHER!!!

$$T_{16} := \frac{\frac{204.74\ ft^2}{.125 \cdot .125}}{RF_L} \cdot V_{LR} = 1840.02\ kip$$

$$A_{16} := .8333\ ft \cdot 116\ ft = 96.663\ ft^2$$

$$v_{16} := \frac{T_{16}}{M_s \cdot A_{16}} = 35.251\ psi$$

< 100 psi **EQN 4-8**

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$$T_J := \frac{\frac{130.83\ ft^2 + 96.32\ ft^2}{.125 \cdot .125}}{RF_L} \cdot F_{LR} + \frac{\frac{96.32}{.125 \cdot .125}\ ft^2}{FL_{2cc} + FL_{2mezz}} \cdot F_2 = 2344.234\ kip$$

$$A_J := .8333\ ft \cdot 247.333\ ft = 206.103\ ft^2$$

$$v_{DA} := \frac{T_J}{M_s \cdot A_J} = 21.063\ psi$$ < 70 psi **EQN 4-8**

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PC1 & PC1a "Quick Checks"

REINFORCING STEEL

ORIGINAL: 8" CMU

$$A_{st8V} := \frac{.61\ in^2}{15\ in \cdot 8\ in} = 0.00508$$ > .0012 **PASS**

$$A_{st8H} := \frac{.61\ in^2}{15\ in \cdot 8\ in} = 0.00508$$ > .002 **PASS**

$$A_{st8} := A_{st8V} + A_{st8H} = 0.01017$$ > .002 **PASS**

$$\frac{26.5\ ft}{40} = 7.95\ in$$ < 10.5" **PASS**
7.5" CONCRETE + 3" INSULATION

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PC1 & PC1a "Quick Checks"

WALL ANCHORAGE

$\psi := \frac{1+1.3}{2} = 1.15$ Limited Safety S-4

LOW ROOF:

3/4" AB w/ 4" EMBED (ASSUME) 32" o.c.

$T := \psi \cdot S_{xs} \cdot 101.25\ psf \cdot 32\ in \cdot \frac{26.5\ ft}{2} = 6.426\ kip$ **EQN 4-12**

BOLTS ARE LOADED IN TENSION OUT OF PLANE

$f_{sy} := 36\ ksi$ $d := \frac{3}{4}\ in$ $A_{sa} := .334\ in^2$

$h_{ef} := 4\ in$ $A_{Nco} := (2 \cdot h_{ef} \cdot 1.5)^2 = 144\ in^2$ $A_{Nc} := A_{Nco} = 1\ ft^2$

$f'_c := 3000\ psi$

$N_{sa} := A_{sa} \cdot 1.9 \cdot f_{sy} = 22.846\ kip$ ACI 318-19 **Eqn 17.6.1.2**

$N_b := 24 \cdot \sqrt{\frac{f'_c}{psi}}\ psi \cdot \left(\frac{h_{ef}}{in}\right)^{1.5}\ in^2 = 10.516\ kip$ ACI 318-19 **Eqn 17.6.2.2.3**

$\psi_{ec} := 1$ $\psi_{ed} := 1$ $\psi_c := 1$ $\psi_{cp} := 1$

$N_{cb} := \frac{A_{Nc}}{A_{Nco}} \cdot \psi_{ec} \cdot \psi_{ed} \cdot \psi_c \cdot \psi_{cp} \cdot N_b = 10.516\ kip$ ACI 318-19 **Eqn 17.6.2.1a**

$N_p := 8 \cdot \frac{d^2 \cdot \pi}{4} \cdot f'_c = 10.603\ kip$ ACI 318-19 **Eqn 17.6.3.2.2a**

$N_{pn} := N_p \cdot \psi_{cp}$ ACI 318-19 **Eqn 17.6.3.1**

$T_{allow} := min(N_b, N_{sa}, N_{pn}, N_{cb}) = 10.516\ kip$ > $T = 6.426\ kip$ **PASS**

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RM1 & RM2 "Quick Checks"

4.4.3.3 Shear Stress in Shear Walls. The average shear stress in shear walls, v_j^{avg}, shall be calculated in accordance with Eq. (4-8).

$$v_j^{avg} = \frac{1}{M_s}\left(\frac{V_j}{A_w}\right) \quad (4\text{-}8)$$

where

V_j = Story shear at level j computed in accordance with Section 4.4.2.2;
A_w = Summation of the horizontal cross-sectional area of all shear walls in the direction of loading. Openings shall be taken into consideration where computing A_w. For masonry walls, the net area shall be used. For wood-framed walls, the length shall be used rather than the area; and
M_s = System modification factor; M_s shall be taken from Table 4-8.

Table 4-8. M_s Factors for Shear Walls

	Level of Performance		
Wall Type	**CP[a]**	**LS[a]**	**IO[a]**
Reinforced concrete, precast concrete, wood, reinforced masonry, and cold-formed steel	4.5	3.0	1.5
Unreinforced masonry	1.75	1.25	1.0

[a] CP = Collapse Prevention, LS = Life Safety, IO = Immediate Occupancy.

$$M_s := \frac{4.5+3.0}{2} = 3.75$$

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$$T_7 := \frac{\frac{256.9\ ft^2}{.125 \cdot .125}}{RF_L} \cdot F_{LR} + \frac{\frac{99.5}{.125 \cdot .125}\ ft^2}{FL_{2cc} + FL_{2mezz}} \cdot F_2 = 2611.256\ kip$$

$$A_7 := .667\ ft \cdot 44.5\ ft = 29.682\ ft^2$$

$$v_7 := \frac{T_7}{M_s \cdot A_7} = 162.918\ psi$$

< 70 psi **EQN 4-8**

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$$T_{D.A} := \frac{\frac{223.43\ ft^2}{.125 \cdot .125}}{RF_L} \cdot F_{LR} + \frac{\frac{60.22}{.125 \cdot .125}\ ft^2}{FL_{2cc} + FL_{2mezz}} \cdot F_2 = 2159.47\ kip$$

$$A_{D.A} := .667\ ft \cdot 56\ ft = 37.352\ ft^2$$

$$v_{D.A} := \frac{T_{D.A}}{M_s \cdot A_{D.A}} = 107.063\ psi$$

< 70 psi **EQN 4-8**

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RM1 & RM2 "Quick Checks"

REINFORCING STEEL

ORIGINAL: 8" CMU

$$A_{st8V} := \frac{.61\ in^2}{32\ in \cdot 8\ in} = 0.00238$$ > .0007 **PASS**

$$A_{st8H} := \frac{.61\ in^2}{32\ in \cdot 8\ in} = 0.00238$$ > .0007 **PASS**

$$A_{st8} := A_{st8V} + A_{st8H} = 0.00477$$ > .002 **PASS**

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WALL ANCHORAGE

$\psi := \frac{1+1.3}{2} = 1.15$ Limited Safety S-4

ORIGINAL: T.O.W. CHANNEL

C cont w/ 4" L @ 6' 8" o.c * 8" CMU wall w/ Reinf 32" o.c. * Max/2 Unbraced Height

$T_{c8} := \psi \cdot S_{xs} \cdot 50\ psf \cdot 6.6666\ ft \cdot \frac{26.5\ ft}{2} = 7.934\ kip$ **EQN 4-12**

$l_b := 7\ in$ $f'_m := 1350\ psi$

$l_{be8} := 3.625\ in$ $f_y := 36\ ksi$

$d := \frac{3}{4}\ in$

$A_{pt} := \pi \cdot l_b^{\,2} = 1.069\ ft^2$ TMS 402 **Eqn 6-5**

$A_{pv} := \frac{\pi \cdot l_{be8}^{\,2}}{2} = 0.143\ ft^2$ TMS 402 **Eqn 6-6**

$A_b := \frac{d^2 \cdot \pi}{4} = 0.003\ ft^2$

$B_{vnb} := 4 \cdot A_{pv} \cdot \sqrt{\frac{f'_m}{psi}}\ psi = 3.034\ kip$ TMS 402 **Eqn 9-6**

$B_{vnc} := 1750\ lbf \cdot \sqrt[4]{\frac{f'_m \cdot A_b}{lbf}} = 8.648\ kip$ TMS 402 **Eqn 9-7**

$B_{vnpry} := 8 \cdot A_{pt} \cdot \sqrt{\frac{f'_m}{psi}}\ psi = 45.248\ kip$ TMS 402 **Eqn 9-8**

$B_{vns} := .6 \cdot A_b \cdot f_y = 9.543\ kip$ TMS 402 **Eqn 9-9**

$T := min\left(B_{vnb}, B_{vnc}, B_{vnpry}, B_{vns}\right) = 3.034\ kip$ < $T_{c8} = 7.934\ kip$ **FAIL**

ORIGINAL: 8" CMU TYP

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RM1 & RM2 "Quick Checks"

AB 24" o.c * 8" CMU wall w/ Reinf 32" o.c. * Max/2 Unbraced Height

$T_{c8} := \psi \cdot S_{xs} \cdot 50\ psf \cdot 24\ in \cdot \frac{26.5\ ft}{2} = 2.38\ kip$ **EQN 4-12**

$l_b := 7\ in$ $f'_m := 1350\ psi$

$l_{be8} := 3.625\ in$ $f_y := 36\ ksi$

$d := \frac{3}{4}\ in$

TMS 402 **Eqn 6-5**

$A_{pt} := \pi \cdot l_b^{\,2} = 1.069\ ft^2$

TMS 402 **Eqn 6-6**

$A_{pv} := \frac{\pi \cdot l_{be8}^{\,2}}{2} = 0.143\ ft^2$

$A_b := \frac{d^2 \cdot \pi}{4} = 0.003\ ft^2$

TMS 402 **Eqn 9-6**

$B_{vnb} := 4 \cdot A_{pv} \cdot \sqrt{\frac{f'_m}{psi}}\ psi = 3.034\ kip$

TMS 402 **Eqn 9-7**

$B_{vnc} := 1750\ lbf \cdot \sqrt[4]{\frac{f'_m \cdot A_b}{lbf}} = 8.648\ kip$

TMS 402 **Eqn 9-8**

$B_{vnpry} := 8 \cdot A_{pt} \cdot \sqrt{\frac{f'_m}{psi}}\ psi = 45.248\ kip$

TMS 402 **Eqn 9-9**

$B_{vns} := .6 \cdot A_b \cdot f_y = 9.543\ kip$

$T := min(B_{vnb}, B_{vnc}, B_{vnpry}, B_{vns}) = 3.034\ kip$ > $T_{c8} = 2.38\ kip$ **PASS**

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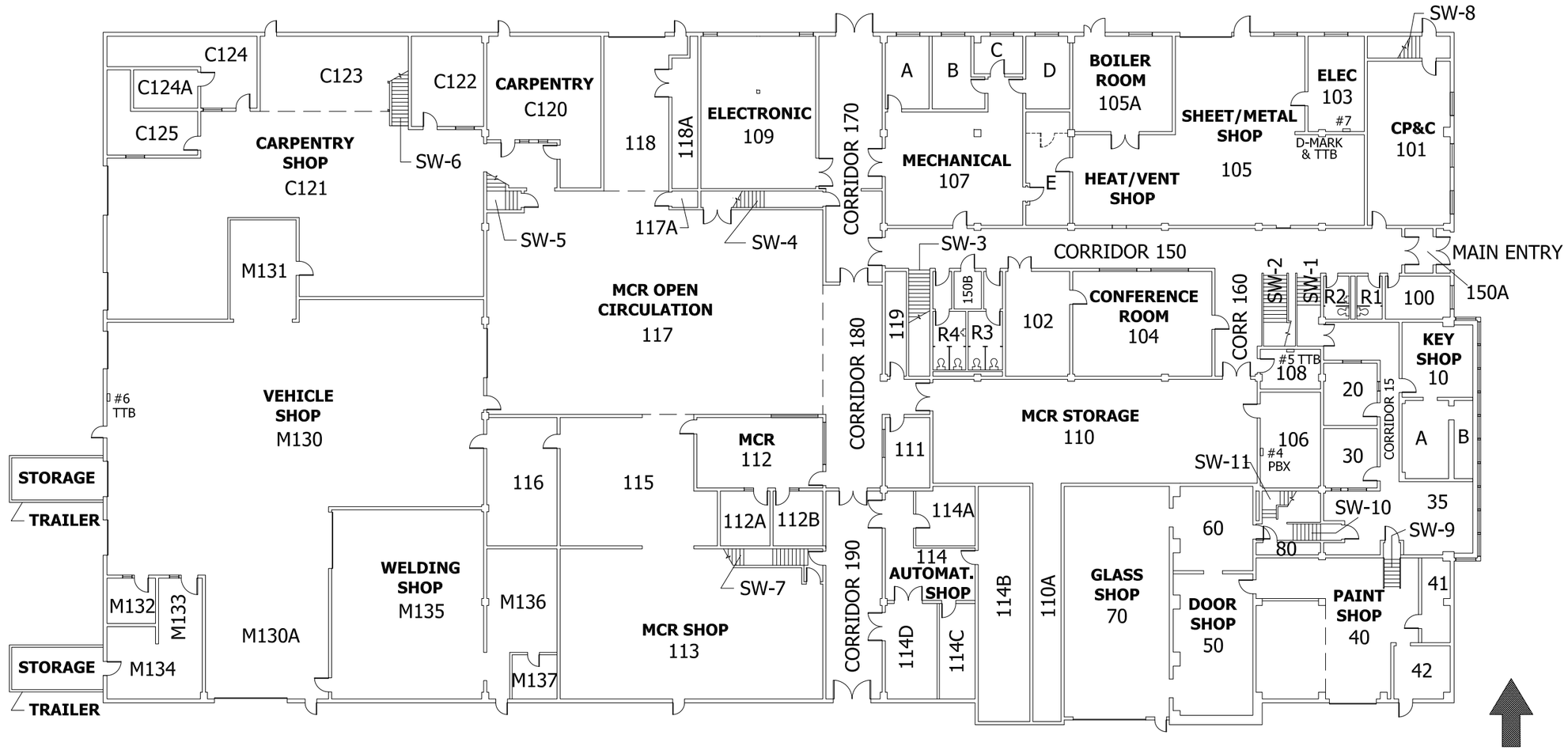


CP&C / MAINTENANCE BUILDING - FIRST FLOOR

ANCHORAGE SCHOOL DISTRICT

PROJECT TITLE:
C&PC AND MAINTENANCE
1301 LABAR STREET
ANCHORAGE, ALASKA 99515

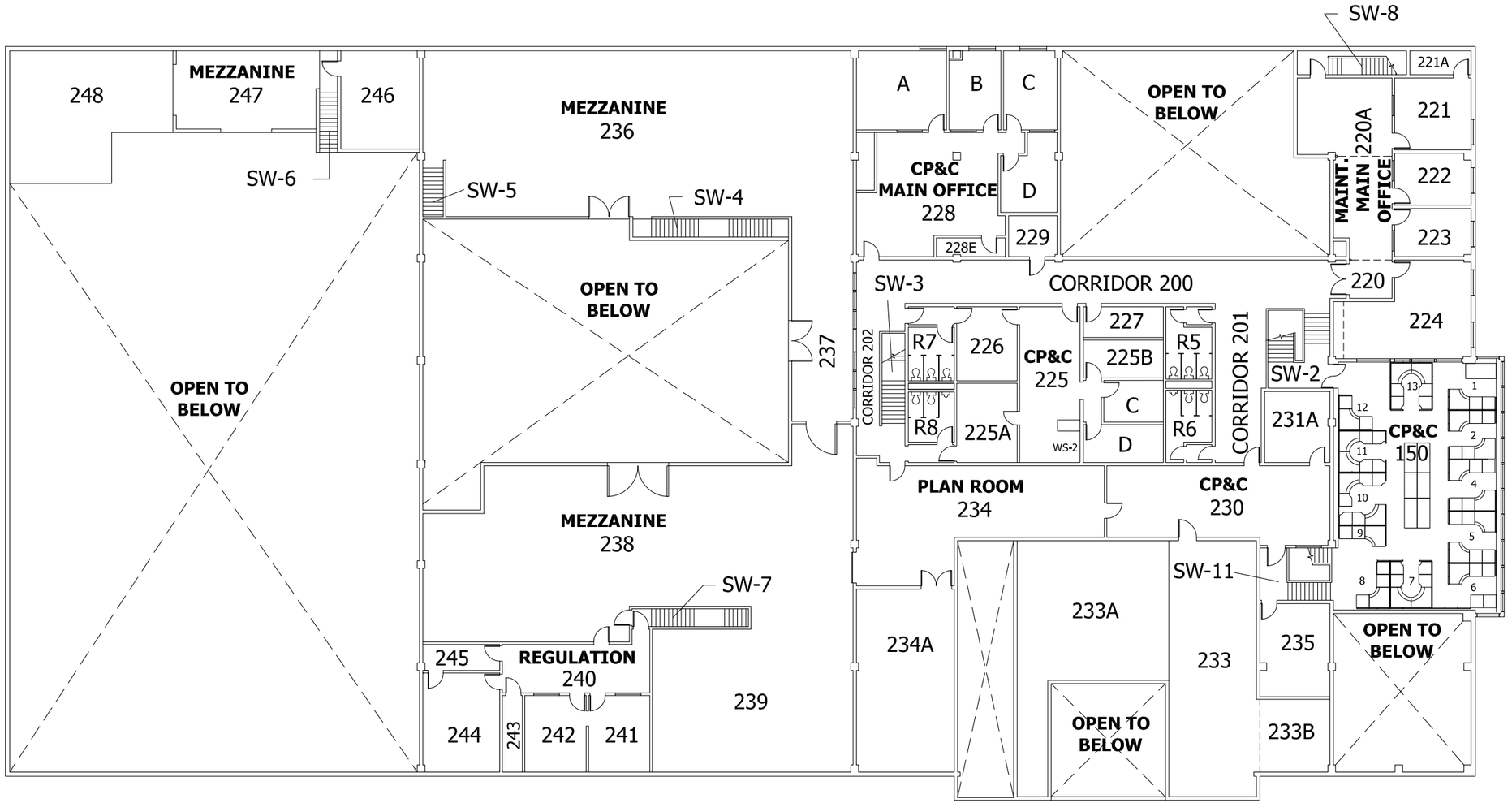
SHEET TITLE:
FIRST FLOOR PLAN

DRAWN:
CHECKED:
DATE: 04/17/1997
REVISIONS: 08/17/2016

SCALE: N/A

SHEET NO.
1 OF 2

NORTH



MAINTENANCE - FACILITIES BUILDING - SECOND FLOOR/MEZZANINE

ANCHORAGE SCHOOL DISTRICT

PROJECT TITLE:
C&PC AND MAINTENANCE
1301 LABAR STREET
ANCHORAGE, ALASKA 99515

SHEET TITLE:
SECOND / MEZZANINE
FLOOR PLAN

DRAWN:
CHECKED:
DATE: 04/17/1997
REVISIONS: 08/17/2016

SCALE: N/A

SHEET NO.
2 OF 2

A. GENERAL

Proposers/Offerors are advised that, notwithstanding any instructions or implications elsewhere in this RFP, only the documents shown and detailed on this Check List need to be submitted with and made part of their proposal/offer. Proposers/Offerors are hereby advised that failure to submit the documents shown and detailed on this Check List may be justification for rendering the proposal/offer non-responsive.

B. REQUIRED DOCUMENTS FOR OFFER PROPOSAL SUBMISSION

1. Attachment A, Proposal Transmittal Form
   Submit the completed Proposal Transmittal Form (Attachment A) as the first page of the proposal per Site.

2. All addenda issued should be acknowledged by manually signing the Addenda sheet and submitting it prior to the offer opening, or by indicating acknowledgement in the space provided on the Attachment A, Proposal Transmittal Form.

Items 3, 4, 5, & 6 TO BE SUBMITTED AS PART OF ORIGINAL PROPOSAL OR WITHIN THREE (3) CALENDAR DAYS OF NOTICE FROM THE DISTRICT IF NOT SUBMITTED WITH PROPOSAL.

DBE PARTICIPATION REQUIREMENTS MUST BE COMPLETED BY THE PROPOSAL SUBMISSION DATE.

ONLY 1 COPY OF 3, 4, 5 & 6 (below) is to be submitted.

3. Exhibit 1, Supplemental Term, Conditions and Forms

   - ✓ 1. Acknowledgement of Terms, Conditions, and Grant Clauses General Grant Clauses
   - ✓ 2. Certification Regarding Lobbying

4. Exhibit 2, Disadvantaged Business Enterprises, Contract Participation Form

5. Exhibit 3, Disadvantaged Business Enterprises, Prime Consultant/Contractor Certification

   - ✓ 1. Prime Consultant/Contractor Certification

6. Exhibit 4, Disadvantaged Business Enterprises, Contact Documentation Form

   - ✓ 1. Contact Documentation Form

EXHIBIT 1: SUPPLEMENTAL TERMS AND CONDITIONS
(2 C.F.R. § 200.326 and 2 C.F.R. Part 200, Appendix II, Required Contract Clauses)

The supplemental conditions contained in this section are intended to cooperate with, to supplement, and to modify the general conditions and other specifications **for the acquisition of supplies, services, equipment, or construction services to insure compliance with 2 C.F.R. § 200.317 through 200.327 and 2 C.F.R. Part 200, Appendix II** for contracts being awarded using Federal Grant funds.

1. Flow Down of Terms and Conditions from the Grant Agreement

Subcontracts: If the vendor Subcontracts any of the work required under this Agreement, a copy of the signed Subcontract must be forwarded to the Anchorage School District ("District") for review and approval. The vendor agrees to include in the Subcontract that (i) the Subcontractor is bound by the terms of this Agreement, (ii) the Subcontractor is bound by all applicable local, state and federal laws and regulations, and (iii) the Subcontractor shall hold the District harmless against all claims of whatever nature arising out of the Subcontractor's performance of work under this Agreement, to the extent allowed and required by law.

2. Compliance with Executive Order 11246 of September 24, 1965, entitled "Equal Employment Opportunity," as amended by Executive Order 11375 of October 13, 1967, and as supplemented in Department of Labor regulations

During the performance of this contract, the Contractor agrees as follows:

(1) The Contractor will not discriminate against any employee or applicant for employment because of race, creed, color, or national origin. The Contractor will take affirmative action to ensure that applicants are employed, and that employees are treated during employment, without regard to their race, creed, color, or national origin. Such action shall include, but not be limited to the following: employment, upgrading, demotion, or transfer; recruitment or recruitment advertising; layoff or termination; rates of pay or other forms of compensation; and selection for training, including apprenticeship. The Contractor agrees to post in conspicuous places, available to employees and applicants for employment, notices to be provided by the contracting officer setting forth the provisions of this nondiscrimination clause.

(2) The Contractor will, in all solicitations or advertisements for employees placed by or on behalf of the Contractor, state that all qualified applicants will receive consideration for employment without regard to race, creed, color, or national origin.

(3) The Contractor will send to each labor union or representative of workers with which he has a collective bargaining agreement or other contract or understanding, a notice, to be provided by the agency contracting officer, advising the labor union or workers' representative of the Contractor's commitments under Section 202 of Executive Order No. 11246 of September 24, 1965, as amended by Executive Order No. 11375, and shall post copies of the notice in conspicuous places available to employees and applicants for employment.

(4) The Contractor will comply with all provisions of Executive Order No. 11246 of Sept. 24, 1965, and of the rules, regulations, and relevant orders of the Secretary of Labor.

(5) The Contractor will furnish all information and reports required by Executive Order No. 11246 of September 24, 1965, and by the rules, regulations, and orders of the Secretary of Labor, or pursuant thereto, and will permit access to his books, records, and accounts by the contracting agency and the Secretary of Labor for purposes of investigation to ascertain compliance with such rules, regulations, and orders.

(6) In the event of the Contractor's noncompliance with the nondiscrimination clauses of this contract or with any of such rules, regulations, or orders, this contract may be cancelled, terminated or suspended in whole or in part and the Contractor may be declared ineligible for further Government contracts in accordance with procedures authorized in Executive Order No. 11246 of Sept 24, 1965, and such other sanctions may be imposed and remedies invoked as provided in Executive Order No. 11246 of September 24, 1965, or by rule, regulation, or order of the Secretary of Labor, or as otherwise provided by law.

(7) The Contractor will include the *portion of the sentence immediately preceding the first paragraph* and the provisions of Paragraphs (1) through (7) in every Subcontract or purchase order unless exempted by rules, regulations, or orders of the Secretary of Labor issued pursuant to Section 204 of Executive Order No. 11246 of Sept. 24, 1965, so that such provisions will be binding upon each Subcontractor or Vendor. The Contractor will take such action with respect to any Subcontract or Purchase Order as the contracting agency may direct as a means of enforcing such provisions including sanctions for noncompliance: Provided, however, That in the event the Contractor becomes involved in, or is threatened with, litigation with a Subcontractor or Vendor as a result of such direction by the contracting agency, the Contractor may request the United States to enter into such litigation to protect the interests of the United States."

(8) The contractor will include the portion of the sentence immediately preceding paragraph (1) and the provisions of paragraphs (1) through (8) in every subcontract or purchase order unless exempted by rules, regulations, or orders of the Secretary of Labor issued pursuant to section 204 of Executive Order 11246 of September 24, 1965, so that such provisions will be binding upon each subcontractor or vendor. The contractor will take such action with respect to any subcontract or purchase order as the administering agency may direct as a means of enforcing such provisions, including sanctions for noncompliance: Provided, however, that in the event a contractor becomes involved in, or is threatened with, litigation with a subcontractor or vendor as a result of such direction by the administering agency, the contractor may request the United States to enter into such litigation to protect the interests of the United States. The applicant further agrees that it will be bound by the above equal opportunity clause with respect to its own employment practices when it participates in federally assisted construction work: Provided that if the applicant so participating is a State or local government, the above equal opportunity clause is not applicable to any agency, instrumentality or subdivision of such government which does not participate in work on or under the contract. The applicant agrees that it will assist and cooperate actively with the administering agency and the Secretary of Labor in obtaining the compliance of contractors and subcontractors with the equal opportunity clause and the rules, regulations, and relevant orders of the Secretary of Labor, that it will furnish the administering agency and the Secretary of Labor such information as they may require for the supervision of such compliance, and that it will otherwise assist the administering agency in the discharge of the agency's primary responsibility for securing compliance. The applicant further agrees that it will refrain from entering into any contract or contract modification subject to Executive Order 11246 of September 24, 1965, with a contractor debarred from, or who has not demonstrated eligibility for, Government contracts and federally assisted construction contracts pursuant to the Executive Order and will carry out such sanctions and penalties for violation of the equal opportunity clause as may be imposed upon contractors and subcontractors by the administering agency or the Secretary of Labor pursuant to Part II, Subpart D of the Executive Order. In addition, the applicant agrees that if it fails or refuses to comply with these undertakings, the administering agency may take any or all of the following actions: Cancel, terminate, or suspend in whole or in part this grant (contract, loan, insurance, guarantee); refrain from extending any further assistance to the applicant under the program with respect to which the failure or refund occurred until satisfactory assurance of

future compliance has been received from such applicant; and refer the case to the Department of Justice for appropriate legal proceedings.

3. Davis Bacon Act (See Contract Provisions within Original Contract, if applicable); and Copeland Anti-Kickback Act (See Attached Certification, if applicable).

Note: In situations where the Davis-Bacon Act does not apply, neither does the Copeland "Anti-Kickback Act.

4. Contract Work Hours and Safety Standards Act of 1962, 40 U.S.C. 327 et seq.

The Contractor agrees it will require that mechanics and laborers (including watchmen and guards) employed on this federally assisted contract be paid wages of not less than one and one-half times their basic wage rates for all hours worked in excess of forty hours in a work week.

(1) Overtime requirements. No contractor or subcontractor contracting for any part of the contract work which may require or involve the employment of laborers or mechanics shall require or permit any such laborer or mechanic in any workweek in which he or she is employed on such work to work in excess of forty hours in such workweek unless such laborer or mechanic receives compensation at a rate not less than one and one-half times the basic rate of pay for all hours worked in excess of forty hours in such workweek.

(2) Violation; liability for unpaid wages; liquidated damages. In the event of any violation of the clause set forth in paragraph (b)(1) of this section the contractor and any subcontractor responsible therefor shall be liable for the unpaid wages. In addition, such contractor and subcontractor shall be liable to the United States (in the case of work done under contract for the District of Columbia or a territory, to such District or to such territory), for liquidated damages. Such liquidated damages shall be computed with respect to each individual laborer or mechanic, including watchmen and guards, employed in violation of the clause set forth in paragraph (b)(1) of this section, in the sum of $26 for each calendar day on which such individual was required or permitted to work in excess of the standard workweek of forty hours without payment of the overtime wages required by the clause set forth in paragraph (b)(1) of this section.

(3) Withholding for unpaid wages and liquidated damages. The (write in the name of the Federal agency or the loan or grant recipient) shall upon its own action or upon written request of an authorized representative of the Department of Labor withhold or cause to be withheld, from any moneys payable on account of work performed by the contractor or subcontractor under any such contract or any other Federal contract with the same prime contractor, or any other federally-assisted contract subject to the Contract Work Hours and Safety Standards Act, which is held by the same prime contractor, such sums as may be determined to be necessary to satisfy any liabilities of such contractor or subcontractor for unpaid wages and liquidated damages as provided in the clause set forth in paragraph (b)(2) of this section.

(4) Subcontracts. The contractor or subcontractor shall insert in any subcontracts the clauses set forth in paragraph (b)(1) through (4) of this section and also a clause requiring the subcontractors to include these clauses in any lower tier subcontracts. The prime contractor shall be responsible for compliance by any subcontractor or lower tier subcontractor with the clauses set forth in paragraphs (b)(1) through (4) of this section.

5. Federal Fair Labor Standards Act, 29 U.S.C. Section 201 et seq.

The Contractor agrees it will require that covered employees be paid at least the minimum prescribed wage, and also that they be paid one and one-half times their basic wage rates for all hours worked in excess of the prescribed work-week.

6. Copeland "Anti-Kickback" Act (U.S.C. Section 51)

The Contractor agrees to comply with the Copeland Anti-Kickback Act of 1968, if applicable, which outlaws and prescribes penalties for "kickbacks" of wages in federally financed or assisted construction activities.

7. Reporting

The Contractor will provide any information requested by the District which is determined to be required to comply with 2 C.F.R. § 200 requirements and regulations pertaining to reporting.

8. Patents and Data

No reports, maps, or other documents produced in whole or in part under this contract shall be the subject of an application for copyright by or on behalf of the Contractor. The grantor agency and the grantee shall possess all rights to invention or discovery, as well as rights in data which may arise as a result of the Contractor's services.

9. Clean Air Act, Federal Water Pollution Control Act, Executive Order 11738, and US EPA Regulations

Contracts and sub grants of amounts in excess of $100,000 shall contain a provision that requires the Contractor or recipient to comply with all applicable standards, orders, or requirements issued under Section 112 and 306 of the Clean Air Act (42 U.S.C. § 1857 (h), Section 508 of the Clean Water Act (33 U.S. 1368), Executive Order 11738, and the U.S. Environmental Protection Agency regulations (40 CFR Part 15 and 61). Violations shall be reported to the Federal awarding agency and the Regional Office of the Environmental Protection Agency (EPA).

10. Energy Conservation Requirements - 42 USC 6201

Energy Conservation - The Contractor agrees to comply with mandatory standards and policies relating to energy efficiency, which are contained in the state energy conservation plan issued in compliance with the Energy Policy and Conservation Act.

11. If appropriate to the project, the Contractor will provide assurances regarding the following:

- **Procurement of Recovered Materials.** The requirements of Section 6002 of the Solid Waste Disposal Act, Pub. L. No. 89.272 (1965) (codified as amended by the Resource Conservation and Recovery Act at 42 U.S.C. § 6962. The requirements of 6002 include procuring only items designated in guidelines of EPA 40 C.F.R. Part 247 that contain the highest percentage of recovered materials practicable, consistent with maintaining a satisfactory level of competition, where the purchase price of the item exceeds $10,000.

    a) In the performance of this contract, the Contractor shall make maximum use of products containing recovered materials that are EPA-designated items unless the product cannot be acquired –
        i. Competitively within a timeframe providing for compliance with the contract performance schedule;
        ii. Meeting contract performance requirements; or
        iii. At a reasonable price.

    b) Information about this requirement, along with the list of EPA-designate items, is available at EPA's Comprehensive Procurement Guidelines website, https://www.epa.gov/smm/comprehensive-procurement-guideline-cpg-program.

THE FOLLOWING DOCUMENTS NEED TO BE RETURNED TO THE DISTRICT.

1. Acknowledgement of Terms, Conditions, and Grant Clauses
2. Certification Regarding Lobbying

Acknowledgement of Terms, Conditions, and Grant Clauses

Flow Down of Terms and Conditions from the Grant Agreement

Subcontracts: If the Vendor Subcontracts any of the work required under this Agreement, a copy of the signed Subcontract must be available to the Department for review and approval. The Vendor agrees to include in the Subcontract that (i) the Subcontractor is bound by the terms of this Agreement, (ii) the Subcontractor is bound by all applicable state and federal laws and regulations, and (iii) the Subcontractor shall hold the District harmless against all claims of whatever nature arising out of the Subcontractor's performance of work under this Agreement, to the extent allowed and required by law.

Grant Clauses

On behalf of my firm, I acknowledge, and agree to perform all of the specifications and grant requirements identified in this document.

Vendor/Contractor Name _____ Date _____

Authorized Signature _____

Email Address _____

Address/Phone Number

_____

_____

Contract Number _____

CERTIFICATION REGARDING LOBBYING

(Byrd Anti-Lobbying Amendment, awards over $100,000)

The undersigned _____ (Vendor/ Contractor) certifies, to the best of his or her knowledge and belief, that:

(1) No Federal appropriated funds have been paid or will be paid, by or on behalf of the undersigned, to any person for influencing or attempting to influence an officer or employee of an agency, a Member of Congress, an officer or employee of Congress, or an employee of a Member of Congress in connection with the awarding of any Federal Contract, the making of any Federal grant, the making of any Federal loan, the entering into of any cooperative agreement, and the extension, continuation, renewal, amendment, or modification of any Federal Contract, grant, loan, or cooperative agreement.

(2) If any funds other than Federal appropriated funds have been paid or will be paid to any person for making lobbying contacts to an officer or employee of any agency, a Member of Congress, an officer or employee of Congress, or an employee of a Member of Congress in connection with this Federal Contract, grant, loan, or cooperative agreement, the undersigned shall complete and submit Standard Form--LLL, "Disclosure Form to Report Lobbying," in accordance with its instructions [as amended by "Government wide Guidance for New Restrictions on Lobbying," 61 Fed. Reg. 1413 (1/19/96). Note: Language in paragraph (2) herein has been modified in accordance with Section 10 of the Lobbying Disclosure Act of 1995 (P.L. 104-65, to be codified at 2 U.S.C. 1601, et seq.)]

(3) The undersigned shall require that the language of this certification be included in the award documents for all sub awards at all tiers (including Subcontracts, sub grants, and Contracts under grants, loans, and cooperative agreements) and that all sub recipients shall certify and disclose accordingly.

This certification is a material representation of fact upon which reliance was placed when this transaction was made or entered into. Submission of this certification is a prerequisite for making or entering into this transaction imposed by 31, U.S.C. § 1352 (as amended by the Lobbying Disclosure Act of 1995). Any person who fails to file the required certification shall be subject to a civil penalty of not less than $10,000 and not more than $100,000 for each such failure.

[Note: Pursuant to 31 U.S.C. § 1352(c)(1)-(2)(A), any person who makes a prohibited expenditure or fails to file or amend a required certification or disclosure form shall be subject to a civil penalty of not less than $10,000 and not more than $100,000 for each such expenditure or failure.]

The Vendor/Contractor, _____, certifies or affirms the truthfulness and accuracy of each statement of its certification and disclosure, if any. In addition, the Contractor understands and agrees that the provisions of 31 U.S.C. A 3801, et seq., apply to this certification and disclosure, if any.

_____ Signature of Vendor/Contractor's Authorized Official

_____ Name and Title of Vendor/Contractor's Authorized Official

_____ Date

EXHIBIT 2
Disadvantaged Business Enterprises
CONTRACT PARTICIPATION FORM

Efforts to Obtain MBE/WBE/LSAF Participation

A. Please answer the following questions and return this questionnaire with attachments (i.e., ads, meeting attendance list, etc.) to the Purchasing Agent with your offer.

Project Name: _____
Solicitation Number: _____
Contractor: _____

B. Did your company: YES/NO

1. Attend any pre-proposal meetings that were scheduled by the District? ☒ **Yes** ☐ No ☐ **N/A (provide documentation)**

   If YES, please list the meetings (e.g. site-visit, pre-proposal conference, proposal reading) attended below.

   a)
   b)
   c)

2. Did your company utilize the services or assistance, as appropriate, of such organizations as the Small Business Administration, Alaska District Office, the Department of Transportation and Public Facilities (DOT), Civil Rights Office and/or the US Department of Labor?

   ☐ **Yes** ☐ No ☐ **N/A (provide documentation)**

3. Advertise subcontracting opportunities in major circulation newspapers, such as:

   a) Anchorage Daily News?
   b) Pubic Website?
   c) Plans Rooms?
   d) Other types of notices?

   ☐ **Yes** ☐ No ☐ **N/A (provide documentation)**

   If YES, please attach copies of any ads or notices.

4. Provide timely written notice to specific MBEs/WBEs/LSAFs that their interest it the contract is being solicited? ☐ **Yes** ☐ No ☐ **N/A (provide documentation)**

   If YES, please attach a sample of such notification and list MBEs/WBEs contacted on the Contact Documentation Form (Exhibit 4).

5. Follow-up initial solicitations of interest by personally contacting MBEs/WBEs/LSAFs? ☐ **Yes** ☐ No ☐ **N/A (provide documentation)**

   If YES, please list those MBEs/WBEs/LSAFs contacted on the Contact Documentation Form (Exhibit 4).

6. Select the portions of the contract to be performed by MBEs/WBEs/LSAFs in a manner that will increase the likelihood of MBE/WBE/LSAF participation? ☐ **Yes** ☐ No ☐ **N/A (provide documentation)**

   If YES, please attach a list of those portions of the contract selected for MBE/WBE/LASF participation.

7. Provide interested MBEs/WBEs/LSAFs with timely and thorough information about the plans, specifications and technical requirements of the contract? ☐ **Yes** ☐ No ☐ **N/A (provide documentation)**

   If YES, please list the MBEs/WBEs/LSAFs provided with such information on the Contact Documentation Form (Exhibit 4).

8. Negotiate in good faith with interested MBEs/WBEs/LSAFs, and not reject MBEs/WBEs/LSAFs as unqualified without sound reasons based on a thorough investigation of their capabilities? ☐ **Yes** ☐ No ☐ **N/A (provide documentation)**

   If YES, list MBEs/WBEs/LSAFs with whom good faith negotiations were conducted on the Contact Documentation Form (Exhibit 4).

9. Assist interested MBEs/WBEs/LSAFs in obtaining bonding and/or insurance. ☐ **Yes** ☐ No ☐ **N/A (provide documentation)**

   If YES, list MBEs/WBEs/LSAFs assisted on the Contact Documentation Form (Exhibit 4).

10. For each question answered "YES" above that requires a listing of MBEs/WBEs/LSAFs, please provide that listing on this page. Answers need not be limited to a single line. If more space is needed, please attach supplemental sheets. You need only list an MBE/WBE/LSA firm only once. Use the first column to indicate the question(s) referenced above by each firm listed. Any question answered “N/A” above, please provide supporting documentation of good faith efforts taken.

EXHIBIT 3
Disadvantaged Business Enterprises
PRIME CONSULTANT/CONTRACTOR CERTIFICATION

I. PROJECT INFORMATION

Applicant/Entity Name	Total of District Funding
Anchorage School District	$

Prime Consultant/Contractor: _____
Contract Number: _____ **Contract Amount:** _____

II. AFFIRMATIVE STEPS (Applicant to all subcontracts awarded by the prime consultant/contractor)

I understand that it is my responsibility to comply with all state and federal regulations and guidance in the utilization of Minority, Women-Owned Businesses and Labor Surplus Area Firms in procurement. I certify that I will take affirmative steps to afford opportunities for Minority Business Enterprise (MBE), Women-Owned Business Enterprise (WBE) and Labor Surplus Area Firms (LSAF) by:

1. Including qualified MBEs/WBEs/LSAFs on procurement solicitation lists
2. Soliciting potential MBE's/WBE's/LSAFs.
3. Reducing contract size/quantities when economically feasible to permit maximum participation by MBE's/WBE's/LSAFs.
4. Establishing delivery schedules to encourage participation by MBE's/WBE's/LSAFs.
5. Using the services and assistance of the Small Business Administration, Minority Business Development Agency, U.S. Department of Commerce (https://www.sba.gov/), as appropriate, the Department of Transportation and Public Facilities (DOT), Civil Rights Office (http://www.dot.state.ak.us/cvlrts/directory.shtml) and/or the US Department of Labor (http//www.doleta.gov/lsa).
6. Requiring all Prime Consultants/Contractors to follow steps 1-5 listed above in employing MBE/WBE/LSA Subcontractors.

☐ **Exception:** As Prime Consultant/Contractor, I certify that I have reviewed the contract requirements and found no available subcontracting opportunities. I also certify that I will fulfill 100 percent of the contract requirements with my own employees and resources. (Check if applicable).

Signature – Prime Consultant/Contractor	Name & Title (print legibly)	Certification Date

III. DISTRICT APPROVAL SIGNATURE

Signature indicates the form meets DBE Requirements.

District Coordinator	Approval Date

EXHIBIT 4
Disadvantaged Business Enterprises
CONTACT DOCUMENTATION FORM

Project Name: ____ RFQ/ITB/RFP No. ______________

Company Name:
____

This form is provided for your convenience to document your efforts to meet the DBE Affirmative Steps on this project. You may use additional sheets, if needed. You may return this form or other supporting documentation, such as explanations, advertising notices, solicitations, telephone logs, etc. with your Contract Participation Form (Exhibit 2).

Firm: ____ MBE / WBE / LSAF
Address: ____ Phone No: ______________________
____
Type of Work: ____ Amount: $__________________
Dates of Contact: __________ __________ ___________ ___________ ____________
Method of Contact:
____
Name of Person Contacted: ____
Results of Contact: ____
If rejected, why:
____

Firm: ____ MBE / WBE / LSAF
Address: ____ Phone No: ______________________
____
Type of Work: ____ Amount: $__________________
Dates of Contact: __________ __________ ___________ ___________ ____________
Method of Contact:
____
Name of Person Contacted: ____
Results of Contact: ____
If rejected, why:
____

Firm: ____ MBE / WBE / LSAF
Address: ____ Phone No: ______________________
____
Type of Work: ____ Amount: $__________________
Dates of Contact: __________ __________ ___________ ___________ ____________
Method of Contact:
____
Name of Person Contacted: ____
Results of Contact: ____
If rejected, why:
____

Disadvantaged Business Enterprise Program
Program Specifications for District Contracts

This project is a Federally funded contract and, is subject to any applicable federal and state regulations. Bidders/proposers shall be fully informed regarding the requirements of the regulations, statutes, and code regarding the Disadvantaged Business Enterprise Program (DBE).

A bidder/proposer who is determined not in compliance with the requirements of the applicable regulations and code, or these specifications will not be awarded this contract. Noncompliance after award of the contract constitutes a breach of the contract and may result in termination of the contract or other appropriate remedy for such breach.

Part I. Disadvantaged Business Enterprise Program Goals and Six Affirmative Steps.

All bidders/proposers shall solicit subcontractor or supplier bids/offers prior to bid/proposal opening for this project. The bidder/proposer acknowledges that post-bid/proposal opening of solicitations do not qualify for meeting Fair Share objectives or the Six Affirmative Steps.

A. All bidders/proposers on this project **shall** carry out the required Six Affirmative Steps, listed as items 1 through 6 below:

   1. Include qualified small, minority, women's business enterprises, and labor surplus area firms on solicitation lists.
   2. Assure that small, minority, women's business enterprises, and labor surplus area firms are solicited. If the MBE/WBE is only certified as a Disadvantaged Business Enterprise (DBE), such as through the Small Business Administration (SBA), Alaska District Office; and the Alaska Department of Transportation and Public Facilities (DOT&PF), Civil Rights Office, and the bidder has exhausted all efforts to determine the subcontractor MBE/WBE status, the bidder may document either category of certification to meet the good faith efforts.
   3. Divide total requirements when economically feasible, into small tasks or quantities to permit maximum participation of small, minority, women's business enterprises, and labor surplus area firms.
   4. Establish delivery schedules, where requirements of the work permit, which will encourage participation by small, minority, women's business enterprises, and labor surplus area firms.
   5. Use the services and assistance of the U.S. Small Business Administration and the Minority Business Development Agency of the U.S. Department of Commerce, as appropriate.
   6. If the prime contractor or proposer awards subcontracts/procurements, require the subcontractor to take the affirmative steps 1 through 5 above.

   7. Exception: As prime consultant/contractor, certify that they have reviewed the contract requirements and found no available subcontracting opportunities; and certify that they will fulfill 100 percent of the contract requirements with their own employees and resources.

B. The District will presume a lack of six affirmative steps to satisfy MBE, WBE and LSAF requirements if the bidder/proposer rejects any bids/offers from MBEs, WBEs and/or LSAF's, which are as low, or lower, than other competitor's bids/offers. The bidder/proposer that rejects an as-low or lower bid/offer from an MBE, WBE or LSAF may submit proof to rebut this presumption.

C. If a prime contractor is an MBE, WBE or LSAF, such prime also must carry out the Six Affirmative Steps to award any subcontracts or procurements on this project.

D. Record keeping requirements. The prime contractor must retain all records documenting their Six Affirmative Step for audit purposes and provide copies of these to the District DBE Officer upon request.

Apparent successful bidders/proposers, who fail to demonstrate completion of the required Six Affirmative Steps, will not be awarded this contract.

Part II: Certified Minority (MBE) and Women's (WBE) Business Enterprises

A. MBE/WBE, or a joint-venture with a MBE/WBE, must be currently certified prior to opening of bids/proposals in order to be considered a MBE/WBE enterprise.

B. Businesses must be certified by the Small Business Administration (SBA), Alaska District Office https://www.sba.gov/offices/district/ak/anchorage, Department of Transportation and Public Facilities (DOT), Civil Rights Office http://www.dot.state.ak.us/cvlrts/directory.shtml, or by state, local, Tribal or private entities whose certification criteria and who present proof of this will be eligible. Proof may be in the form of a letter from the certifying agency or a current listing in a directory maintained by the certifying agency.

C. Those companies certified as DBEs by one of the agencies listed in Part II.B above:

1. Whose majority ownership and control is vested in one or more minority individuals;
2. Whose majority ownership and control is vested in one or more non-minority women;
3. Whose majority ownership and control is vested in one or more minority individuals, and who are women may be counted toward either the MBE or the WBE, but not to both.

Part III: MBE and WBE Participation

The MBE or WBE must perform work on the project in the category/categories of work for which certification is issued. While the MBE or WBE may perform work in other categories for which certification is not issued, only that work performed in the certified categories.

A. The MBE or WBE must perform a useful business function according to custom and practice in the industry; i.e., must be responsible for the execution of a distinct element of work and must carry out its responsibilities by actually performing, managing, and supervising the work.

B. An MBE or WBE that acts merely as a broker or passive conduit of funds, without performing, managing, or supervising the work of its contract or subcontract in a manner consistent with normal business practices.

1. Presumption. If 50% or more of the total dollar amount of MBE or WBE's prime contract is subcontracted to a non-DBE, the MBE or WBE prime contractor will be presumed to be a broker, and no MBE or WBE participation may be reported.

2. Rebuttal. The MBE or WBE prime contractor may rebut this presumption by demonstrating that its actions are consistent with normal practices for prime contractors in its business and that it will actively perform, manage and supervise the work under this contract.

C. MBE or WBE trucker/hauler expenditures will be credited towards the contract only if the trucker/hauler is performing a commercially useful function. The following factors should be used in determining whether MBE or WBE trucker/hauler is performing a commercially useful function:

1. The MBE or WBE must be responsible for the management and supervision of the entire trucking/hauling operation for which it is responsible on a particular contract, and there cannot be a contrived arrangement for the purpose of meeting MBE or WBE objectives.

2. The MBE or WBE must itself own and operate at least one fully licensed, insured, and operational truck used on the contract.

D. For joint ventures, MBE and WBE participation consists of the portion of the dollar amount of the joint venture attributable to the MBE or WBE. However, where the MBE/WBE's risk of loss, control or management responsibilities are not commensurate with the share of profit.

Part IV: Submission of Minority, Women's Business Enterprises and Labor Surplus Area Firms Information

A. TO BE SUBMITTED AS PART OF BID/PROPOSAL OR WITHIN THREE (3) WORKING DAYS OF NOTICE FROM THE DISTRICT (ASD):

1. The bidder/proposer for this project shall submit their Contact Documentation (Exhibit 4), a completed and signed Prime Consultant/Contractor Certification (Exhibit 3) with their bid/proposal. If the bidder does not intend to utilize MBE, WBE or LSAF subcontractors, their Prime Consultant/Contractor Certification form must still be signed by bidder and, indicate "NONE TO BE USED". The bidder/proposal shall then be required to show that the mandatory Six Affirmative Steps were taken as set forth in these specifications, which are also included in the Contract Participation Form (Exhibit 2).

2. Bids/offers submitted without a completed and signed Contract Participation Form, completed and signed Prime Consultant/Contractor Certification Form, and sufficient Contact Documentation will be considered non-responsive, if not submitted with bid/offer or upon three (3) working days upon request, if not submitted with their bid/proposal.

3. A contract may not be awarded to a bidder/proposer who fails to submit the required supporting documents within the time specified. There shall be no substitutions, deletions, additions, or modifications to this listing subsequent to its submittal to Purchasing.

Part V: MBE/WBE/LSAF Utilization Removal/Substitution

If a successful bidder/proposer for a contract which contains MBE, WBE and/or LSA Firm participation requirements, at any time after award of contract, proposes to remove or make substitutions for MBE, WBE or LSA Firm subcontractors or joint-venture partners under the contract, a written notice of such removal or substitution shall be submitted to the District DBE Officer prior to commencement of performance of the affected work, with the names, addresses and phone numbers of the subcontractors or joint venture partners to be removed or substituted for and an explanation of the reasons for the removal and substitution. The successful bidder shall make good faith efforts as defined in Part I.B to utilize another MBE, WBE or LSA Firm subcontractor as the replacement. These efforts shall be documented and, the circumstances fully explained in writing, and approval obtained from the District DBE Officer prior to such replacement. The District DBE Officer shall, within seven (7) days of receipt of such notice, approve said notice or removal and substitution where it is shown that the requested action is for good cause and not for discriminatory purposes.

Part VI: Other Provisions

The District DBE Officer or his or her designee may visit the job site during regular working hours and interview subcontractors and employees for verification of compliance with these specifications and/or the regulations.

Part VII: Definitions

A. Minority Business Enterprise (MBE) or Women Owned Business Enterprise (WBE) - means a business concern which is owned and controlled by one or more minorities or women. Owned and controlled means a business:

4. Which is at least 51 percent owned by one or more minorities or women, or in the case of a publicly owned business, at least 51% of the stock is owned by one or more minorities or women;

5. Whose management and daily business operations are controlled by one or more such individuals.

B. Minority Individual - means an individual who is a citizen or lawful permanent resident of the United States and who is:

1. Black (a person having origins in any of the black racial groups in Africa);
2. Hispanic (a person of Mexican, Puerto Rican, Cuban, Central or South American, or other Spanish culture or origin, regardless of race);
3. Portuguese (a person of Portugal, Brazilian, or other Portuguese culture or origin, regardless of race);
4. Asian American (a person having origins in any of the original peoples of the Far East, Southeast Asia, the Indian subcontinent, or the Pacific Islands);
5. American Indian and Alaskan Native (a person having origins in any of the original peoples of North America or original peoples of Alaska), and
6. Members of other groups, or other individuals, found to be economically and socially disadvantaged by the United States Small Business Administration under section 8(1) of the federal Small Business Act.

C. Labor Surplus Area (LSA) – is defined as a civil jurisdiction (a city of more than 25,000 or a county, borough, or census area) that has a civilian average annual unemployment rate during the previous two (2) calendar years of 20 percent or more above the average annual civilian unemployment rate for all states during the same 24-month reference period. If the national annual average unemployment rate during the referenced period is less than 6.0 percent, then the qualifying rate is 6.0 percent. If the national annual average unemployment rate during the referenced period is above 10 percent, then the qualifying rate is 10 percent. Please reference the US Department of Labor, Employment and Training Administration at http//www.doleta.gov/lsa. The list becomes effective each October 1 and remains in effect through the following September 30.

D. Certification – a copy of a current MBE/WBE certification from any agency to be used for the District's monitoring of MBE/WBE participation in its program.

E. Joint Venture – a commercial enterprise undertaken by more than one business enterprise jointly, limited in its scope and duration to one project, for the purpose of each enterprises profiting thereby.

F. Fair Share - is a reasonable amount of funds commensurate with the total project funding, demographic factors and the availability of minority and women's businesses. A fair share does not constitute an absolute requirement, but a commitment on the part of the bidder/proposer to attempt to use minority and women's businesses by carrying out the "Good Faith Efforts".

For more information about these specifications, please contact the District DBE Officer at the Anchorage School District, Purchasing Warehouse, 4919 Van Buren Street, Anchorage, AK 99517; telephone (907) 742-8630.

Part VIII – Equal Opportunity, Minority, Women-Owned Business Enterprise and Labor Surplus Area Firm (MBE/WBE/LSAF) Participation

A. Equal Opportunity

No person or firm shall be discriminated against because of race, color, national origin, or sex in the award of District contracts. Further, the Contractor shall not discriminate on the basis of race, color, national origin, or sex in the performance of this contract.

B. MBE/WBE Participation

While there are no MBE/WBE/LSAF goals associated with this solicitation, the District is committed to achieving participation in its contracting programs by business enterprises that are owned and operated by minorities, women and labor surplus area firms (MBEs, WBEs and LSAF) regardless of the size of the enterprise. All bidders/offerors are strongly encouraged to take active steps to maximize the participation of MBEs, WBEs and LSAF in this contract.

C. Technical Assistance

The District will provide assistance to promote the participation of MBEs, WBEs and LSAF in this contract, including the identification of MBEs, WBEs and LSAF. To obtain assistance, interested parties are encouraged to contact the District's Purchasing Office at (907) 742-8621.