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 2026-615 PROFESSIONAL SERVICES BAXTER ELEMENTARY SCHOOL TIER 2/3 SEISMIC EVALUATION**	ISSUED DATE: **November 6, 2025**	DUE: **Prior to 10:00 a.m., Local Time** DATE: **December 3, 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 BAXTER ELEMENTARY SCHOOL** to the District in accordance with the following documents that are a part of this RFP 2026-615:

Cover Page	This Notice/Cover Page	Page(s) 1 – 2
Section I	Instructions to Offerors	Page(s) 3 – 13
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 – 20
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 Updated 07/2025 to Reference IBC 2024 and ASCE 41-23, Version r1, 09/2025	36 Pages
Attachment D	Anchorage School District Seismic Evaluation: Baxter Elementary Tier – 1 Report	156 Pages
Attachment E	Baxter Elementary School Floor Plan	1 Page
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: http://asdk12.org/depts/purchasing/

A copy of the current plan holder's list can be viewed at:
http://apps.asdk12.org/depts/purchasing/meeting/Plan_Holders/2026/615.xlsx

SUBMISSION OF PROPOSALS: Proposals must be submitted to the Anchorage School District Purchasing Department, 4919 Van Buren Street, Anchorage, Alaska 99517 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 2026-615
PROFESSIONAL SERVICES BAXTER ELEMENTARY SCHOOL TIER 2/3 SEISMIC EVALUATION
DUE: Prior to 10:00 a.m., Local Time
DATE: December 3, 2025

ON-SITE VISIT: **An on-site visit will be held at 3:00 p.m., Local Time, November 12, 2025,** at Baxter Elementary School, 2991 Baxter Road, Anchorage, Alaska 99504. Prospective proposers are encouraged to meet the ASD Project Manager at the School's main office entrance and walk through the proposed area of design for this RFP.

PRE-PROPOSAL CONFERENCE: **A pre-proposal conference will be held at 11:00 a.m., Local Time, November 14, 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 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 2026-615 PROFESSIONAL SERVICES BAXTER ELEMENTARY SCHOOL TIER 2/3 SEISMIC EVALUATION

E-mail: purchasing@asdk12.org PREFERRED METHOD
Attn: Shannon Powers, Sr. Purchasing Agent
Reference: RFP 2026-615 PROFESSIONAL SERVICES BAXTER ELEMENTARY SCHOOL 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 2026-615 PROFESSIONAL SERVICES BAXTER ELEMENTARY SCHOOL 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/businesslicensing.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**	20
3.	**MANAGEMENT**	10
4.	**FIRM'S EXPERIENCE**	25
5.	**PROPOSED PROJECT STAFF**	10
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. I**nformation 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: 20

   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: 25

   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: 10

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 Architect/Planner

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 professional services necessary to provide a Tier 2/3 Seismic Evaluation at Baxter Elementary School, 2991 Baxter Road, Anchorage, Alaska 99504.

   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: This project is funded by a Federal Emergency Management Agency (FEMA) Hazard Mitigation Grant Program (HMGP) grant.

   a. The evaluation will follow the Anchorage School District Seismic Evaluation and Retrofit Guide and ASCE 41-23.

   b. Review the attached Tier 1 evaluations.

   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(s).

   e. Complete FEMA Benefit Cost Analysis (BCA) on recommended seismic retrofits, for potential inclusion in a future FEMA grant opportunity.

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.

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. 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 workload. 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.

   b. 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:		December 2025/ January 2026
Anticipated Contract Award/NTP:		February 2026
Draft Report:		August 2026
Final Report, Estimates and BCA:		September 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. Baxter Elementary School
   2991 Baxter Road
   Anchorage, Alaska 99504

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 coordinating with the planning & design section for access to the plans room. Proposer must coordinate the time at least 24 hours 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 Updated 07/2025 to Reference IBC 2024 and ASCE 41-23 Version r1, 09/2025

2. Attachment D – Anchorage School District Seismic Evaluation: Baxter Elementary Tier – 1 Report

3. Attachment E – Baxter Elementary School 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.

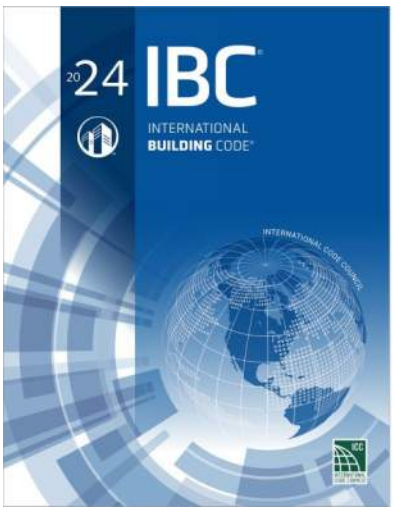
6.12.4 When Work Products produced by the Contractor and its Subcontractors under this Agreement are reused by the Anchorage School District, the Contractor's and Subcontractors' signatures, professional seals and dates shall be removed. Such Work Products, which require professional signature and seal, 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.

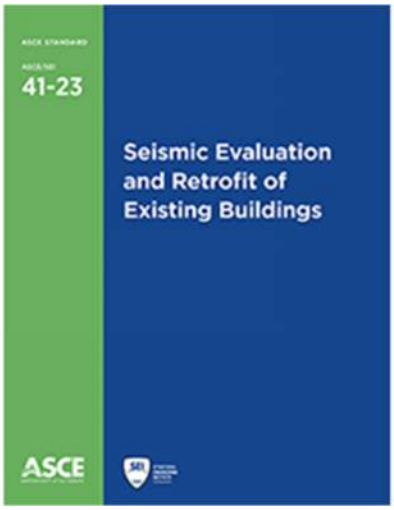
6.12.5 The Contractor shall include this provision in every Subcontract so as to be binding on every Subcontractor.

SEISMIC EVALUATION AND RETROFIT GUIDE

For Existing Anchorage School District Buildings

Updated 07/2025 to Reference IBC 2024 and ASCE 41-23
Version r1, 09/2025





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

Preface

This guide is a revision to the 2021 edition of the Seismic Evaluation and Retrofit Guide for Existing Anchorage School District Buildings. A summary of the most significant changes that are in this current version includes the following:

Significant Changes in ASCE 41-23

- Chapter 4 Tier 1 Screening
  - Changed several of the Tier 1 Quick Check procedures
- Chapter 5 Tier 2 Deficiency-Based Evaluation and Retrofit
  - Aligned the Tier 2 Knowledge Factor with the Tier 3 requirements
  - Updated Tier 2 evaluation requirements for Steel Deck diaphragms
  - Updated the Tier 2 Deficiency-Based Retrofit requirements to include retrofit-specific requirements on the resulting structure, design and detailing requirements, and the definition of the scope of evaluation requirements for existing components
- Chapter 6 Tier 3 Systematic Evaluation and Retrofit
  - Revised the condition assessment and data collection requirements
  - Eliminated the dependence of performance level for data collection and material testing
  - Granted permission to use material property bounding in a nonlinear analysis in lieu of material testing

Significant Changes in ASCE 7-22

- Chapter 7 Snow Loads
  - New risk-targeted snow loads; four separate maps for reliability-targeted ground snow load values for Risk Category I through IV
- Chapter 11 Seismic Design Criteria
  - Site Classes BC, CD, and DE added
  - Use of Default Site Conditions revised
  - Multi-Period Response Spectrum (MPRS) added
  - Risk-targeted maximum considered earthquake (MCE_R) spectral response acceleration parameters shall be obtained from the USGS Seismic Design Geodatabase for the applicable site class

Significant Changes to this 'Seismic Evaluation and Retrofit Guide'

Technical updates were made to align with referenced codes and additional verbiage was added to provide clarity.

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

Contents

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 buildings, 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) 41-23, 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 41-23, 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 41-23, 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 2024 and ASCE 7-22, with local amendments as expected to be adopted by the Municipality of Anchorage (MOA) in the spring of 2026.
  - 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 repairability 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 2024, with local amendments as expected to be adopted by the MOA in the spring of 2026.
  - 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. However, for the majority of Anchorage that is in a high wind zone (basic wind speed, V, for Risk Category II greater than 130 mph), when

a reroof occurs, the existing roof diaphragm, existing connections of the roof diaphragm to roof framing members, and existing roof to wall connection must all be evaluated for a reduced wind load. Reference IEBC Sections 706.2 and 706.3.2 and the MOA's Three Second Gust Wind Zones map, Risk Category II.

- Under an "Alteration – Level 2" the stress in any gravity or lateral element may be increased up to 10% (per expected MOA local amendments) 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 the Retrofit section (Tier 2 or 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. Reference IEBC Section 906.
- 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, by reference, 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 41-23.
  - *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 the building was 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 limitations for using Tier 1 or 2 evaluations. A Tier 3 retrofit is analogous to a new building design under IBC and ASCE 7, with either full or reduced seismic forces, dependent on Seismic Hazard Level.

- 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. Per ASCE 41, 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 causing observable damage to structures. 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.

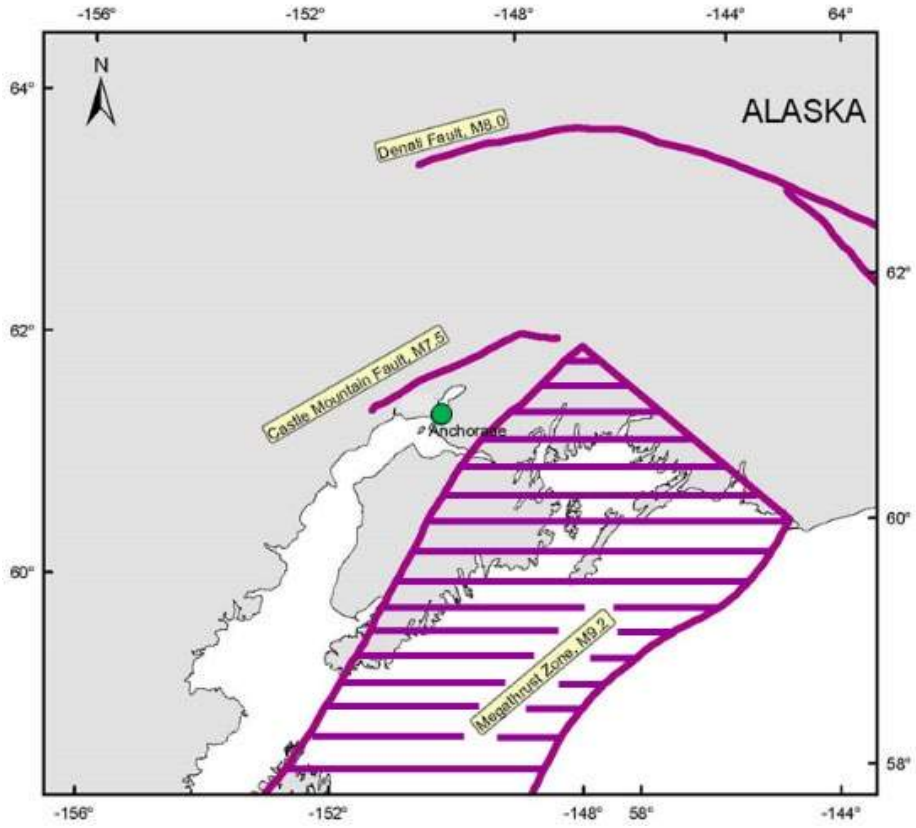


Figure 1: Faults near Anchorage Capable of Producing High Magnitude Earthquakes.

- For Anchorage, Alaska, using the *ASCE Hazard* tool (https://ascehazardtool.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*	*1.54g*	*0.88g*
BSE-1N	*2/3 of BSE-2N (~10% in 50 years)*	*475 years*	*1.03g*	*0.59g*
IBC/ASCE 7, current code, S_{DS}, S_{D1}				
BSE-2E	*5% in 50 years*	*975 years*	*1.38g*	*0.82g*
BSE-1E	*20% in 50 years*	*225 years*	*0.95g*	*0.46g*

Table Note: Seismic accelerations (S_{XS} and S_{X1}), for location and site class described, per ASCE 41-23 are, on average, 8% lower than seismic accelerations per ASCE 41-17. Differences in accelerations between code years are due to refined/increased United States Geological Survey (USGS) data and updates to the US National Seismic Hazard Model (NSHM).

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).

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

    - *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.
    - *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.

- *Structural Performance Not Considered (S-6)* – Used where an evaluation or retrofit does not address the structure.

- *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.

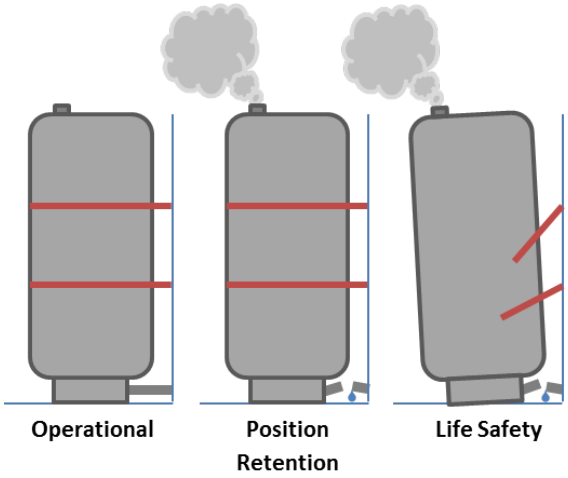


Figure 5: Example of performance levels for nonstructural element (water heater).

- *Nonstructural Performance Not Considered (N-E)* – Used where an evaluation or retrofit does not address all nonstructural components to one of the previous levels (N-A through A-D)

- 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). ASCE 41 also defines Basic Performance Objectives for New Buildings (BPON).
  - 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)	3-C	Structural: Collapse Prevention (S-5)	5-D
	Nonstructural: Life Safety (N-C)		Nonstructural: Hazards reduced (N-D)	
III	Structural: Damage Control (S-2)	2-B	Structural: Limited Safety (S-4)	4-D
	Nonstructural: Position Retention (N-B)		Nonstructural: Hazards reduced (N-D)	
IV	Structural: Immediate Occupancy (S-1)	1-B	Structural: Life Safety (S-3)	3-D
	Nonstructural: Position Retention (N-B)		Nonstructural: Hazards reduced (N-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 (square feet)
  - Building type (e.g. braced frame steel building)
  - Building height
  - Irregularities (plan/vertical)
  - Year(s) of construction/design
- Soil type (A, B, BC, C, CD, D, DE, E, F, or Default)
- Field study
  - Falling hazards
  - Occupancy (Number 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 a -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 3 for the dates that the MOA accepted various benchmark codes. See Table 4 for specific building types and their representative benchmark years, per ASCE 41.

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".

Table 3-2. BPOE Benchmark Building Codes and Standards for Risk Categories I and II.

Building Type[a,b]	Building Seismic Design Provisions				Seismic Evaluation or Retrofit Provisions	
	NBC/SBC	UBC	IBC	NEHRP	FEMA 310[d]/ ASCE/SEI 31[d]	FEMA 356[e]/ ASCE/SEI 41[e]
Wood Light Frames, Small Residential (Type W1)[g]	1993	1976	2000	1985	1998	2000
Wood Light Frames, Large Residential, Commercial, Industrial, and Institutional (Type W2)	*f*	1997	2000	1997	1998	2000
Steel Moment Frames (Types S1 and S1a)	*f*	1997	2000	1997	1998	2000
Steel Concentrically Braced Frames (Types S2 and S2a)	*f*	1997	2000	*f*	1998	2000
Steel Eccentrically Braced Frames (Types S2 and S2a)	*f*	1997	2000	1997	*f*	2000
Steel Buckling-Restrained Braced Frames (Types S2 and S2a)	*f*	*f*	2006	*f*	*f*	2000
Metal Building Frames (Type S3)	*f*	*f*	2000	*f*	1998	2000
Dual Frame Systems with Concrete Shear Walls and Backup Steel Moment Frames (Type S4)	1999	1997	2000	1997	1998	2000
Dual Frame Systems with Steel Braced Frames and Backup Steel Moment Frames (Type S4)	1999	1997	2000	1997	1998	2000
Steel Frames with Infill Masonry Shear Walls (Types S5 and S5a)	*f*	*f*	2000	*f*	1998	2000
Steel Plate Shear Walls (Type S6)	*f*	*f*	2006	*f*	*f*	2000
Cold-Formed Steel Light-Frame Construction: Shear Wall System (Type CFS1)	*f*	1997[h]	2000	1997[h]	*f*	2000[h]
Cold-Formed Steel Light-Frame Construction: Strap-Braced Wall System (Type CFS2)	*f*	*f*	2003	2003	*f*	*f*
Concrete Moment Frames (Type C1)	1999	1997	2000	1997	1998	2000
Concrete Shear Walls (Types C2 and C2a)	1999	1997	2000	1997	1998	2000
Concrete Frames with Infill Masonry Shear Walls (Types C3 and C3a)	*f*	*f*	2000	*f*	1998	2000
Precast or Tilt-Up Concrete Shear Walls (Types PC1 and PC1a)	*f*	1997	2000	*f*	1998	2000
Precast Concrete Frames (Types PC2 and PC2a)	*f*	*f*	2000	*f*	1998	2000
Reinforced Masonry Bearing Walls with Flexible Diaphragms (Type RM1)	*f*	1997	2000	*f*	1998	2000
Reinforced Masonry Baering Walls with Stiff Diaphragms (Type RM2)	1997	1997	2000	1997	1998	2000
Unreinforced Masonry Bearing Walls with Flexible Diaphragms (Type URM)	*f*	*f*	2000	*f*	*f*	2000
Unreinforced Masonry Bearing Walls with Stiff Diaphragms (Type URMa)	*f*	*f*	2000	*f*	1998	2000
Seismic Isolation or Supplemental Energy Dissipation[c]	*f*	1991	2000	*f*	*f*	2000

[a] Building type refers to one of the Common Building Types defined in Table 3-1.
[b] For buildings in areas defined as Very Low Seismicity, the benchmark provisions are limited to the IBC, FEMA 310/ASCE/SEI 31, and FEMA 356/ASCE/SEI 41.
[c] Applies to buildings with seismic isolation or supplemental energy dissipation systems that comply with the cited reference codes and standards.
[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 Level as defined by those provisions.
[f] No benchmark year; buildings must be evaluated using this standard.
[g] W1 buildings located on hillside sites as defined by Table 17-4 cannot be considered Benchmark Buildings.
[h] Only cold-formed steel light-frame buildings with wood structural panel shear walls are permitted to be considered Benchmark Buildings.
Source: NBC = *National Building Code* (BOCA 1993, 1996, 1999); SBC = *Standard Building Code* (SBCC 1993, 1994, 1996, 1997, 1998, 1999); UBC = *Uniform Building Code* (ICBO 1976, 1979, 1982, 1985, 1988, 1991, 1994, 1997); IBC = *International Building Code* (ICC 2000, 2003, 2006, 2009, 2012, 2015, 2018, 2021); NEHRP = *NEHRP Recommended Provisions for the Development of Seismic Regulations for New Buildings* FEMA 95 (BSSC 1985), FEMA 95 (BSSC 1988), FEMA 222 (BSSC 1992), FEMA 222A (BSSC 1995), FEMA 302 (BSSC 1997), FEMA 368 (BSSC 2001). FEMA 310 (1998), ASCE/SEI 31-03 (2003), FEMA 356 (2000), ASCE/SEI 41-06 (2007), ASCE/SEI 41-13 (2014), and ASCE/SEI 41-17 (2017).

Table 4: Benchmark Codes (Table 3-2 excerpt from ASCE 41-23).

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 feet)
- 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* (S-4)	Hazards Reduced** (N-D) (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 (22) 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 (See 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 (including drift and sliding snow)
    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 data collection complies with the requirements for a knowledge factor of 0.9 or 1.0.
- 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 (See 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 (including drift and sliding snow)

   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 Evaluation, ranking, grouping, and the 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. If the IEBC requires any retrofits, Engineer to note on the 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. If the IEBC requires any retrofits, Engineer to note on the contract documents as such.

Deliverables

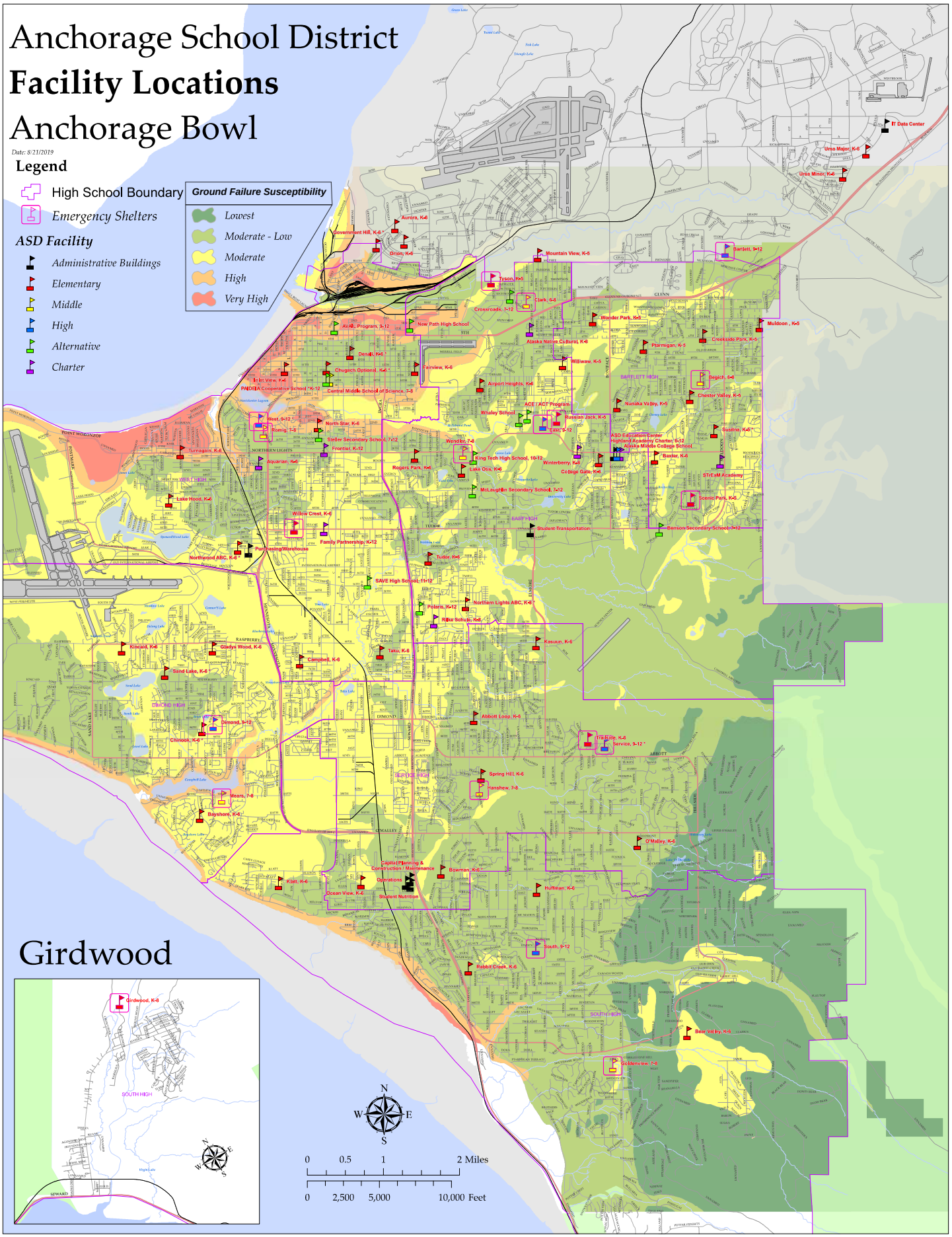
1. Plans, Elevations, and Details to fully describe scope of retrofit, stamped by an Alaska-registered Structural Engineer.
2. Narrative describing deficiencies found in previous reports and detailed explanation of how and to what extent this retrofit strengthens those deficiencies. Include a list of 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.

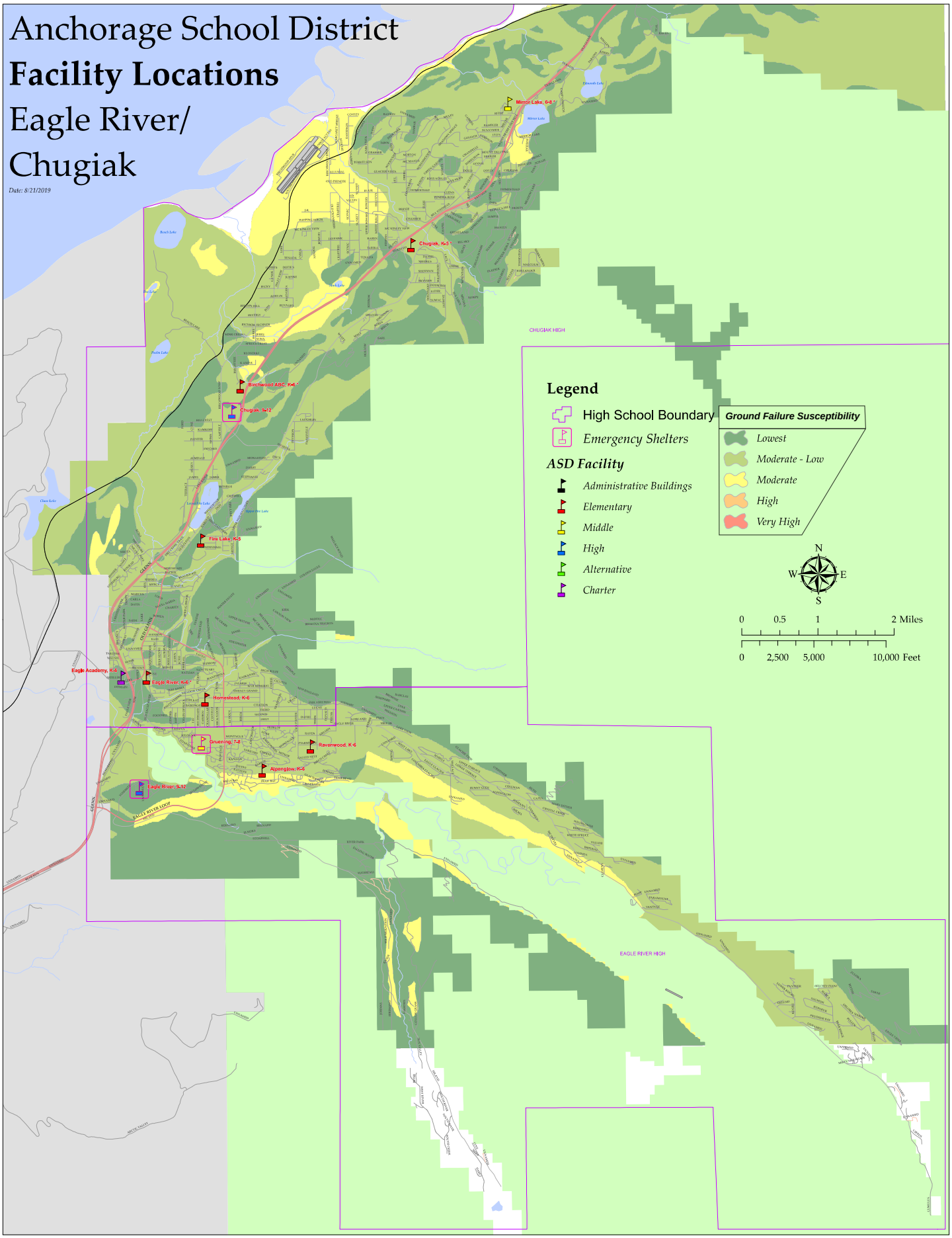
Appendix 1 – Anchorage Ground Failure Susceptibility

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
N
W
E
S
0 0.5 1 2 Miles
0 2,500 5,000 10,000 Feet


Anchorage School District
Facility Locations
Eagle River/
Chugiak
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
N
W
E
S
0 0.5 1 2 Miles
0 2,500 5,000 10,000 Feet
Mirror Lake, K-8
Chugiak, K-5
Birchwood ABC, K-8
Chugiak, 9-12
Fire Lake, K-5
Eagle Academy, K-6
Eagle River, K-5
Homestead, K-6
Gruening, 7-8
Ravenwood, K-6
Alpenglow, K-6
Eagle River, 9-12
CHUGIAK HIGH
EAGLE RIVER HIGH

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)

__

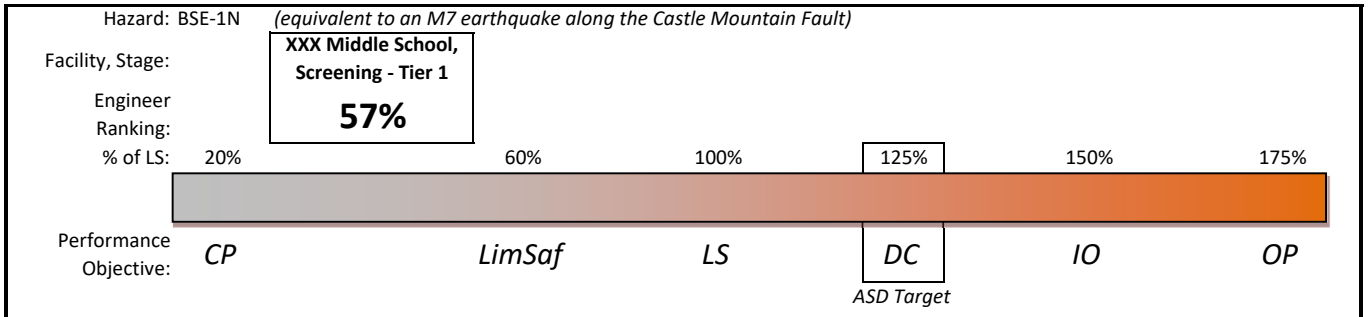
__

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, 91%.
    - 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 0.75 (ratio of BSE-1N S_{XS} to BSE-2E S_{XS} Anchorage, AK). Therefore, if the BSE-2E ranking is just above Limited Safety (68%), the BSE-1N ranking that would be reported would be 68/0.75 = 91%, 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	XX	24 - EDGE SUPPORT	5	5	4	100
Non-Structural - All Sections	XX	53 - TALL NARROW CONTENTS	5	2	4	40
Non-Structural - All Sections	XX	54 - FALL PRONE CONTENTS	2	4	4	32
Non-Structural - All Sections	XX	5 - SPRINKLER CEILING CLEARANCE	5	1	2	10
Non-Structural - All Sections	XX	28 - LENS COVERS	2	2	2	8
Non-Structural - All Sections	XX	25 - SEISMIC JOINTS	0	1	1	0
BOILER REPLACEMENT PROJECT						
Non-Structural - All Sections	XX	8 - HAZARDOUS MATERIAL STORAGE	5	3	4	60
Non-Structural - All Sections	XX	11 - FLEXIBLE COUPLINGS	5	2	1	10
Non-Structural - All Sections	XX	67 - FLEXIBLE COUPLINGS	2	5	1	10
Non-Structural - All Sections	XX	2 - FLEXIBLE COUPLINGS	5	1	1	5

Index

ANCHORAGE SCHOOL DISTRICT SEISMIC EVALUATION: *BAXTER ELEMENTARY*

TIER – 1 REPORT

March 2022

Prepared for:

Anchorage School District
Educating All Students for Success in Life

Anchorage School District

Prepared by:

PDC ENGINEERS
PLAN • DESIGN • CONSTRUCT
A RESPEC COMPANY

2700 Gambell Street, Suite 500
Anchorage, Alaska 99503
AECC163270

21156AN

21156AN Baxter Elementary **March 2022**
Seismic Evaluation **Tier – 1 Report**

TABLE OF CONTENTS

FIGURES

TABLES

APPENDICES

Appendix A – Relative Priority Ranking of Tier 1 Deficiencies
Appendix B – Tier – 1 Checklists
Appendix C – Structural Evaluation Calculations

ABBREVIATIONS

ACI	American Concrete Institute
ASCE	American Society of Civil Engineers
ASCE 41	Seismic Evaluation and Retrofit of Existing buildings
ASD	Anchorage School District
BGS	Below Ground Surface
CIP	Cast-in-Place
CMU	Concrete Masonry Unit
FEMA	Federal Emergency Management Agency
IBC	International Building Code
LFRS	Lateral Force Resisting System
MCEr	Maximum Considered Earthquake, Risk Targeted
MOA	Municipality of Anchorage
WF	Wide Flange
R	Force Reduction Factor (ASCE 7)
SFRS	Seismic Force Resisting System
UBC	Uniform Building Code
TMS	The Masonry Society
TS	Tube Steel
VFRS	Vertical Force Resisting System

PREPARED BY

Nathaniel Cox, EIT

REVIEWED BY

Everet Megli, PE, SE

EXECUTIVE SUMMARY

This report presents the findings of a seismic evaluation of the Baxter Elementary located at 2991 Baxter Road, Anchorage, AK. A Tier-1 evaluation per ASCE 41-17 was performed with the aim of identifying elements of the building which are not likely to achieve the desired seismic performance.

The evaluation criteria used are related to the magnitude and frequency of expected earthquakes and their resulting damage. The Baxter Elementary building was evaluated against the Basic Seismic Performance Objectives for Existing buildings *(BPOE)* for a risk category III building. The building is classified as representing a substantial risk hazard to human life, risk category III, because it is an educational facility with more than 250 occupants. The expectation for a building meeting these criteria is for the structure to sustain significant damage, but have some margin against collapse during an earthquake which is expected to occur at-least once every 975 years. This represents the minimum acceptable seismic performance for existing buildings under the 2018 International Building Code *(IBC).*

The seismic evaluation began with a collection of all available information regarding the design and construction. A site visit was conducted to determine the as-built condition of the building and assess the condition of the lateral force resisting system *(LFRS)*. Finally, basic seismic calculations were performed and select elements of the LFRS were evaluated for conformance with the acceptance criteria per the ASCE 41 standard.

Multiple elements of the LFRS are not in conformance with the Tier – 1 criteria and are not expected to meet the minimum seismic performance goals. The non-conforming elements of the LFRS are detailed in this report. The elements of greatest concern are the anchorage of the exterior reinforced CMU walls to the roof diaphragm and the potential for liquefaction of the soils supporting the building. Additional non-conforming elements found include, the braced frame supporting the mechanical penthouse and the connection of the south library wall to the concrete floor deck.

The Tier – 1 procedure represents a rough analysis of the LFRS of the building. A Tier – 2 evaluation per ASCE 41 may be used to definitively determine if the building will meet the target seismic performance goals.

In addition to the LFRS evaluation, non-structural components were evaluated using the ASCE 41 Tier – 1 checklists. Non-conforming and unknown items are included in this report. In general, the mechanical and electrical non-structural components are not in conformance with the Tier -1 standards. Most floor mounted equipment is anchored to the concrete floor slab. Hanging and in-line equipment generally does not have adequate seismic bracing. All distribution systems excluding the sprinkler system lack adequate bracing. The architectural finishes are generally in conformance. A summary of all non-conforming non-structural elements is presented Table 13.

1 INTRODUCTION

This report presents the findings of a seismic performance evaluation and recommended seismic upgrades for Baxter Elementary school, located at 2991 Baxter Road. Baxter elementary was originally constructed in 1973. A large-scale renovation and addition project was completed around 2000.

Figure 1 – Baxter Elementary School, 3d rendering from Google Earth.

The evaluation is voluntary in nature and is not required by the adopted building code and conducted in accordance with the Tier – 1 procedure in per ASCE 41-17. The goal of this evaluation is to obtain a preliminary review of the building condition with a broad look at the structure for survivability during a major earthquake. The Tier-1 evaluation process involves:

- Defining of the seismic hazards & performance goals
- Conducting a high-level seismic analysis
- Evaluating the critical elements of the LFRS & Non-structural components
- Providing schematic retrofits where required
- Ranking deficiencies to prioritize retrofit work

The work being presented in this report represents the first step towards determining the seismic performance of the building and what, if any, retrofits are required to achieve the target seismic performance level.

2 BUILDING DESCRIPTION

The original building is a one-story reinforced masonry and steel framed structure constructed around 1973. Based on the date of the construction drawings, we anticipate the original building code to have been the 1970 UBC. The original building was designed by Maynard & Wirum Architects with structural design provided by Huseby & Jacobs P.E. Structural Engineers. In 1999 a significant renovation and multiple additions were constructed.

The renovation project was designed under the 1997 UBC by BDS architects with structural design by BBFM Engineers, inc. The project involved four new additions and a mechanical penthouse.

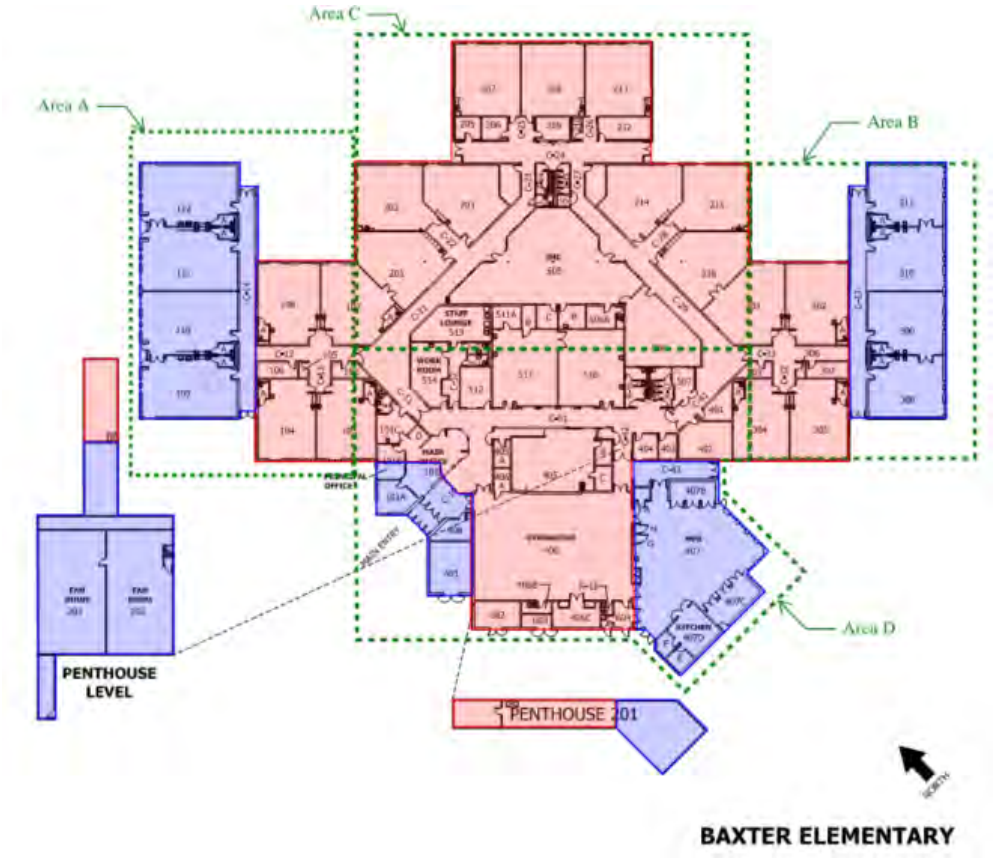


Figure 2 – Baxter Elementary key plan. The 1973 original building is shaded in red and the 1999 addition is shaded in purple. Areas A-D are boxed with green dashed lines for reference.

1973 Original Building | 1999 Renovation and Addition

The structural system can be broken down into two categories: the vertical force resisting system *(VFRS),* and the lateral force resisting system *(LFRS)*. The vertical force resisting system supports the weight of the building and occupant loading. The lateral force resisting system supports the building under the action of lateral loading from wind and earthquakes.

Vertical Force Resisting System (VFRS)

The Vertical Force Resisting System carries the weight of the building and any occupant loading. A brief overview of the occupancy and vertical force resisting system is provided in Table 1.

Table 1 – Vertical Force Resisting System summary.

Floor		Occupancy	Floor / Roof System	Vertical Supports
0	Ground Floor	Educational	4" Concrete slab-on-grade	8" Reinforced CMU stem wall & reinforced concrete foundations
1	Main Roof	Un-occupied	1½" x 20Ga metal roof deck on steel joists & WF girders	8" Reinforced CMU Walls & Tube Steel Columns
	Penthouse Floors Central & South	Mechanical	6-7" Thick concrete slab at original penthouse & 1½" x 20ga composite metal deck topped with 2 ½" concrete supported by non-composite steel wide flange beams at addition.	6"-8" Reinforced CMU Walls at original and steel tube columns at addition
2	Penthouse Roof	Un-occupied	1½" x 20Ga metal roof deck on steel joists & WF girders	Steel tube columns

Lateral Force Resisting System (LFRS)

Earthquake induced inertial loads developed at each story are transferred through horizontal diaphragms to the vertical elements of the LFRS. The vertical elements of the LFRS then transfer the lateral loads into the foundation system.

A brief overview of the lateral force resisting system at each floor is given in Table 2. A comparison of the occupancy, risk category, and snow loads is provided in Table 3. Comparison of the seismic and wind design forces is shown in Table 4 and Table 5.

The seismic force required by the original code is significantly less than the 2018 IBC. This is primarily due to higher seismic accelerations, higher performance requirements for risk category III buildings, and a recognition that special detailing of the reinforced CMU shear walls is required to achieve higher force reduction factors, *R*.

Table 2 - Lateral Force Resisting System.

Roof / Floor	Diaphragm (Horizontal Elements)	LFRS (Vertical Elements)
1 Penthouse Floor	6-7" reinforced Concrete slab and ½" x 20ga composite metal deck topped with 2 ½" concrete	6-8" reinforced CMU shear walls
1 Main Roof	1½" x 20Ga metal roof deck	8" CMU shear walls (reinforced) 12" CMU shear walls (reinforced)
2 Penthouse Roof	1½" x 20Ga metal roof deck	Steel braced frames, central 8" reinforced CMU shear walls, south

Table 3 – Occupancy & snow comparisons between the original building code and the 2018 IBC.

Criteria	1970 UBC	Reference	2018 IBC	Reference
Occupancy Rating	C	Sec. 501	Educational	Sec. 310
Risk Category	Not applicable		III	Table 1604.5
Importance Factor	Not applicable		1.1	Table 1.5-2 ASCE 7-16
Roof Snow Load	40	Record Drawings	40	MOA Min.

a) Roof snow loads include effects of importance factor.

Table 4 - Seismic design force comparison between the original building code and the 2018 IBC.

Criteria	1970 UBC	Reference	2018 IBC	Reference
Importance Factor	Not applicable		1.25	Table 1.5-2 ASCE 7-16
Seismic Acceleration	1.0 g	Seismic Zone 3	1.2 g	USGS seismic maps
Ductility R – Factor	R ~ 3.9		R = 2.0 Ordinary Reinforced Concrete Masonry	
Base Shear [a]	456 kip	Eq. 14-1	1,799 kip	Eq. 12.8-1

a) Base shear is calculated at ASD levels for comparison to legacy codes.

Table 5 - Building information and Code comparison between the original building code and the 2018 IBC.

Criteria	1970 UBC	Reference	2018 IBC	Reference
Wind Speed[a] (3-sec Gust)	100 MPH	Record Drawings	128 mph (165 mph LRFD)	MOA Wind Map
Wind Pressure [b]	25	Record Drawings	22.6	ASCE 7-16 *Part 2*

a) Wind calculated at ASD levels for comparison to legacy codes.
b) Pressure represents combined windward and leeward effects at interior zones. MWFRS wall pressures at ASD levels.

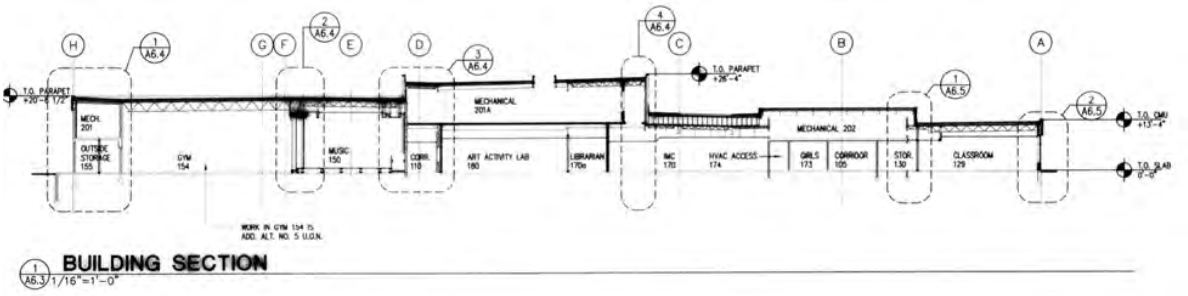


Figure 3 - Building X-section through addition, 1999 construction drawings, 1/A6.3.

3 GEOLOGICAL HAZARDS

Baxter Elementary is located in zone three of the MOA Ground Failure Map, indicating moderate ground failure susceptibility, Figure 4. PDC reviewed the available soils information and the topography of the area. The geotechnical hazards and their likelihood at this site are summarized in Table 6.

Table 6 - Geotechnical hazard summary table.

Hazard	Likelihood of Occurrence	Source
Slope Stability Failure	Not likely	No significant slopes present
Surface Fault Rupture	Not likely	Alaska DGGS & USGS fault maps
Liquefaction	Possible	Nearby Soil Bore Logs

Based on a 30-ft deep borehole located approximately 300 feet northeast of the school building, the risk of liquefaction would be considered low. Shallower boreholes to the west of the building indicate shallow groundwater is present but do not provide strength data below 16 feet. Seismic hazard mapping from the MOA indicates a moderate ground failure susceptibility. This is consistent with the limited data available.

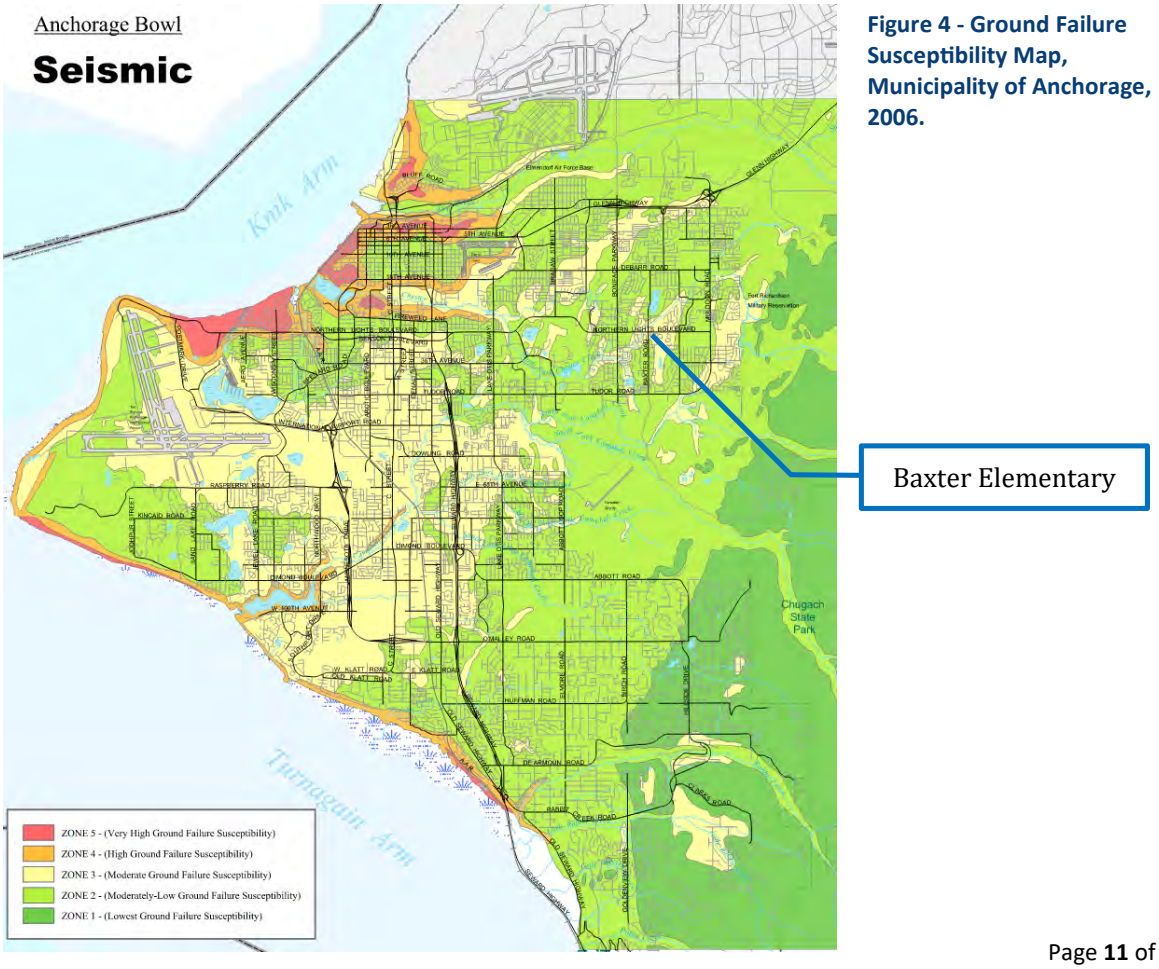


Figure 4 - Ground Failure Susceptibility Map, Municipality of Anchorage, 2006.

4 OVERVIEW OF EVALUATION PROCESS

Baxter Elementary School is being evaluated for seismic performance as a risk category III structure. The intent of this voluntary seismic evaluation is to identify potential areas of concern so they may be retrofitted, improving the seismic performance of the building in future earthquakes. The evaluation procedure follows ASCE 41-17 *Seismic Evaluation and Retrofit of Existing Buildings*. A brief overview of the seismic evaluation process is outlined below:

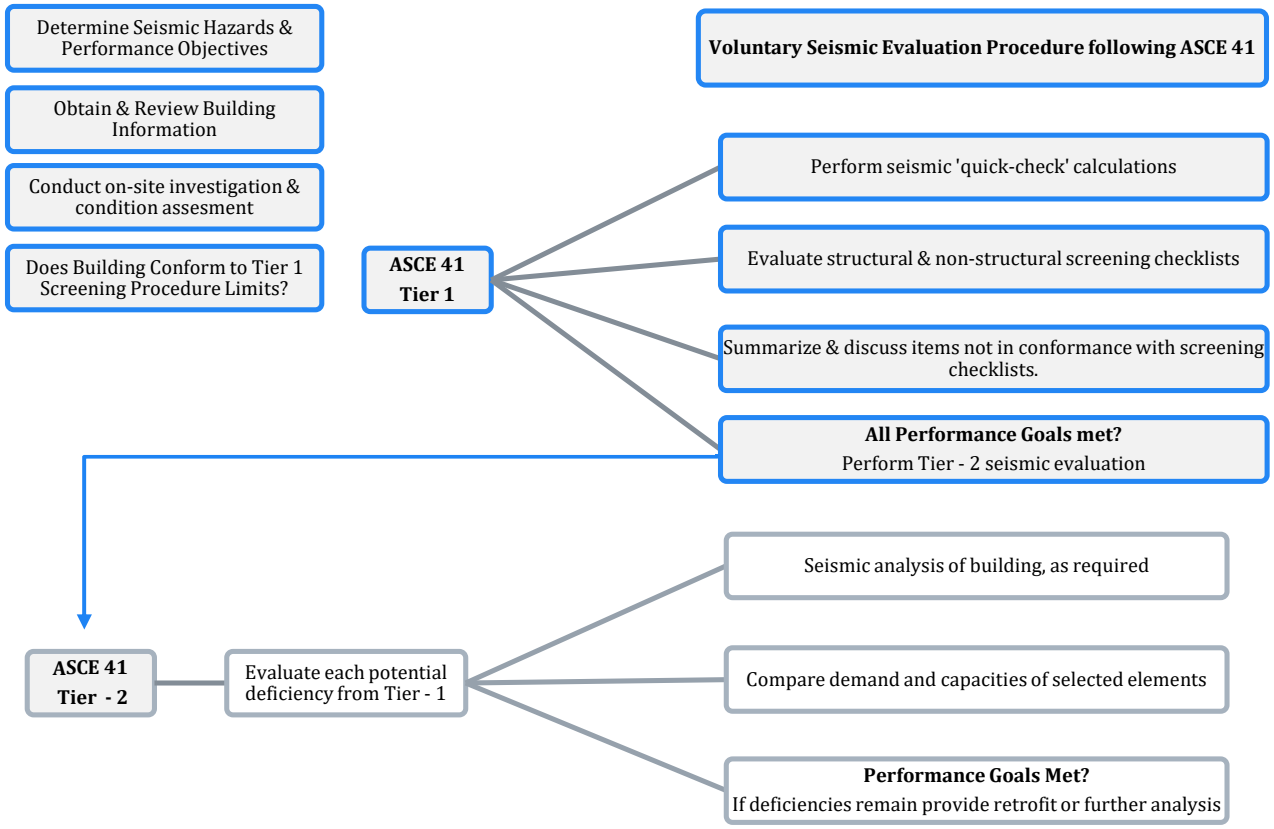


Figure 5 – Voluntary seismic evaluation procedure per ASCE 41, with Tier – 1 evaluation steps outlined in blue.

The Tier – 1 evaluation is a useful tool to quickly and efficiently identify aspects of the building which are not likely to meet the seismic performance goals. The process involves a basic seismic analysis of the structure and evaluation of critical components of the LFRS and non-structural components. The evaluation occurs in the form of a screening checklist categorizing building elements as being either in, conformance, non-conformance, or unknown. Any checklist items marked as unknown or non-conforming do not necessarily indicate that the component is deficient, only that it requires a more rigorous analysis to determine adequacy. This report will document the findings of the Tier -1 evaluation and make recommendations for further analysis.

Seismic Performance Objectives

The Tier – 1 evaluation procedure per ASCE 41 considers a seismic hazard level concurrent with the basic performance objectives for existing buildings *(BPOE)*. The *BPOE* objectives outline the minimum seismic performance that an existing building should achieve. These objectives were set considering the risk of a structural collapse, frequency, and magnitude of earthquakes at the building location, and financial limitations of a seismic retrofit. The required performance objectives to be met under a Tier - I seismic analysis are given in Table 7. Seismic hazards associated with the BPOE are detailed in the next section.

Table 7 – Seismic performance goals for a risk category III building under a Tier - 1 evaluation.

Hazard	Structural	Non-Structural
BSE-1E	Damage Control Performance (S-2)	Position Retention Non-structural performance (2-B)
BSE-2E [a]	Limited Safety Performance (S-4)	Not Considered

a) The Tier – 1 evaluation procedure only explicitly considers the BSE – 2E hazard and associated performance goals. The performance goals associated with the BSE - 1E hazards are implicitly checked.

Buildings which achieve the *BPOE* level of seismic performance can be expected to experience little damage from relatively frequent, moderate earthquakes, with significant damage and economic loss from severe and infrequent earthquakes. The expected seismic performance of an older building, even with seismic retrofits, is still expected to exhibit worse seismic performance than a modern building. Each level of seismic hazard has an associated level of acceptable damage. A limited description of each level of seismic performance is given in Figure 6. The required performance for the Baxter Elementary building at each hazard level is outlined in blue.

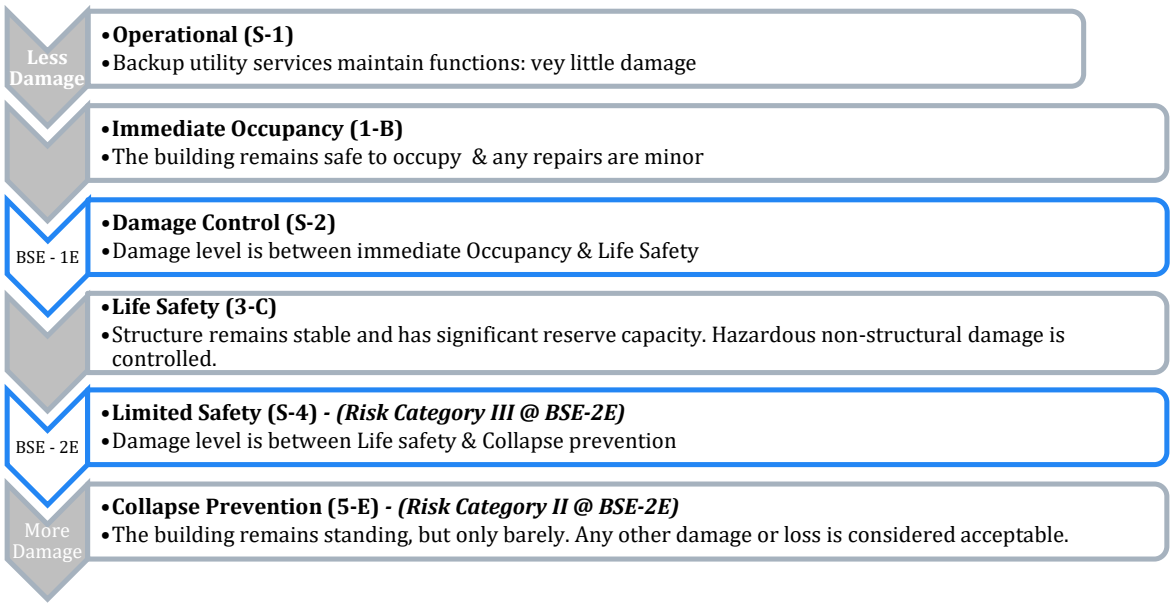


Figure 6 - Scale of target seismic performance objectives, ASCE 41.

Seismic Hazards

The Tier-1 evaluation utilizes the BSE-2E hazard to evaluate the acceptance criteria in the screening checklists. This represents an earthquake expected to occur at least once every 975 years. The seismic hazards selected for the Baxter Elementary school building are outlined in Table 8.

Table 8 - Seismic hazards associated with the basic performance objectives for existing buildings.

BPOE Hazard	Probability of Exceedance	Recurrence Interval	Comparable Modern Seismic Hazard - ASCE 7
BSE-1E	20% in 50 years	225 years	2/3 of MCEr or (BSE – 1N)
BSE-2E [a]	5% in 50 years	975 years	MCEr or (BSE – 2N)

a) The Tier-1 evaluation explicitly considers the BSE-2E seismic hazard only. A Tier – 2 or Tier – 3 evaluation considers both the BSE – 1E & 2E seismic hazards.

Seismic hazards associated with the BPOE are intended to be less severe than that required for a modern building designed per ASCE 7. A comparison of the reduced seismic hazards associated with the BPOE to those of ASCE 7-16 are shown in Figure 4. The BPOE design spectral acceleration is approximately 79% of what is required by the currently adopted building code. Comparable response spectra values are shown with arrows below.

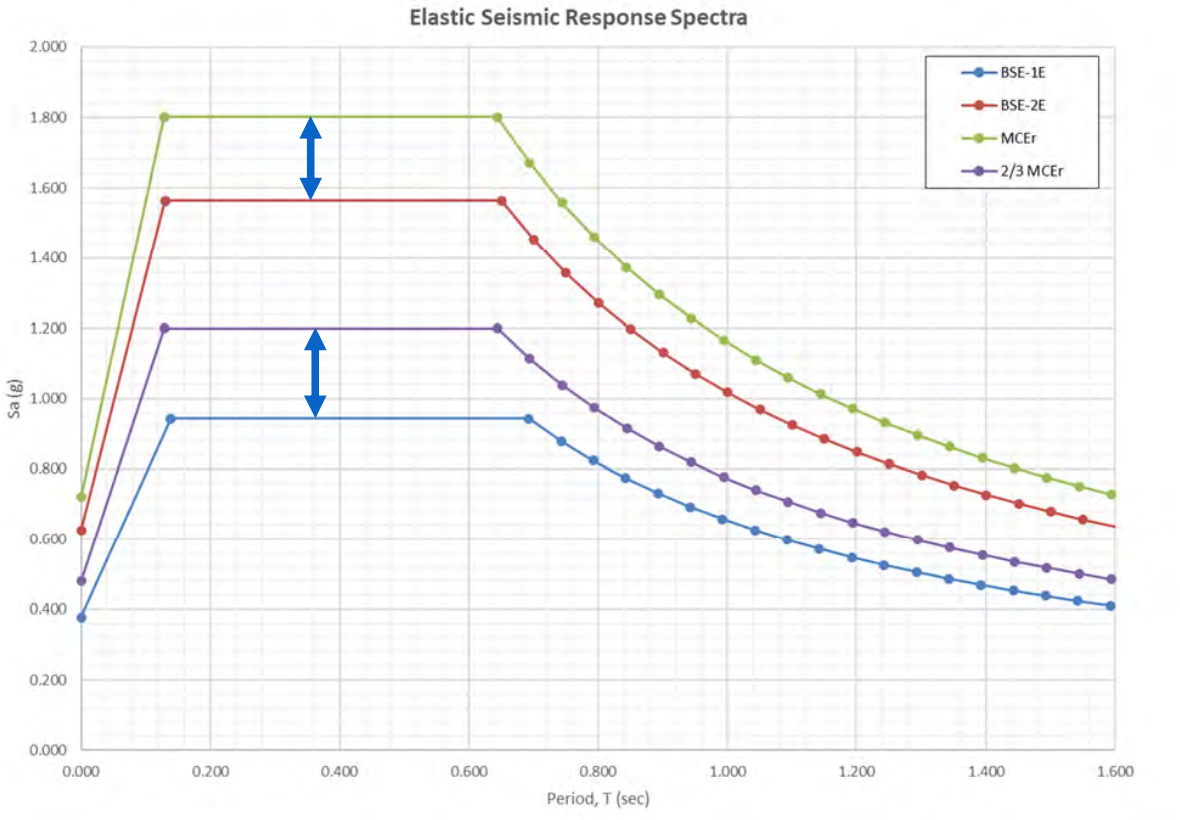


Figure 7 - Seismic response spectra comparison of modern standards to the seismic hazards associated with the BPOE. ***Site Class D (Default) with Fv = 1.2 per ASCE 7-16 11.4.4.***

Available Building Information

ASCE 41 requires sufficient information about the building be gathered and reviewed. Available information included design drawings from 1973 original construction and 1999 Addition and Renovations. No project specifications, geotechnical information, RFI records, submittal information or calculations were available for either the 1973 or 1999 work. In addition, PDC was not able to find any additional geotechnical documentation at the municipal records office.

Document References

The 2018 International Building Code was used. The latest consensus documents available at the present time were used for this report. These primary references include:

- ASD Design Guide — Seismic Evaluation & Retrofit Guide (2021)
- IBC 2018 — International Building Code
- IEBC 2018 — International Existing Building Code
- 1970 UBC — Uniform Building Code
- ASCE/SEI 41-17 — Seismic Evaluation & Retrofit of Existing Buildings.
- ASCE/SEI 7-16 — Minimum Design Loads for Buildings & Other Structures
- ACI 318 – 14 — Building Code Requirements for Structural Concrete
- TMS 402-16 — Building Code Requirements and Specs. for Masonry Construction
- FEMA P-2006 — Example Application Guide for ASCE/SEI 41-17 Seismic Evaluation and Retrofit of Existing Buildings

5 SITE VISIT

Site visits were conducted by David Hoisington, PE, and Nathaniel Cox, EIT, on August 12th and 25th. The goals of the site visits were to:

- Evaluate the condition of the LFRS
- Verify the structure generally conforms with the design drawings
- Evaluate the non-structural components

The scope of the field investigation was limited to items that could be observed without removing or demolishing finishes. The exterior of the building, penthouse mechanical rooms and selected rooms in each of the school wings were observed and documented for the purposes of the Tier 1 inspection items. Generally, the LFRS was in fair condition with no major damage observed. Some deterioration/damage was noted in several locations, as well as a deviation from the design drawings.

The interior CMU walls enclosing the southern mechanical penthouse were damaged in several areas at the second floor CMU wall between the penthouse and the gym, the location is outlined in Figure 8. The damage observed appeared to be caused by the installation of a new duct following the original 1973 construction. Damage in some areas included exposed reinforcement, shown in Figure 23.

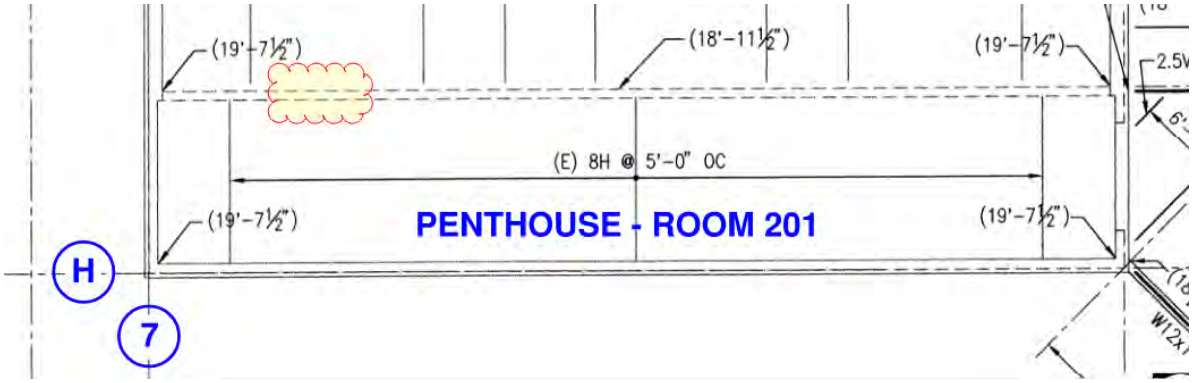


Figure 8 - Southern penthouse, room 201. Observed damage (Figure 23) in CMU wall is clouded.

Additional damage was observed at the top of the stairway to the central mechanical penthouse, located as shown in Figure 9. Cracks were present in the floor slab at the brace to column connection, see Figure 26 and Figure 27.

The connection of the CMU shear wall at the south end of the library, highlighted in Figure 9, did not conform to the design drawings. The drawings call for the CMU wall to extend to the bottom of composite floor deck and for beams to sit in a pocket, per details 10/S3.2 and 9/S4.4, Figure 10. The as-built condition is shown in Figure 11.

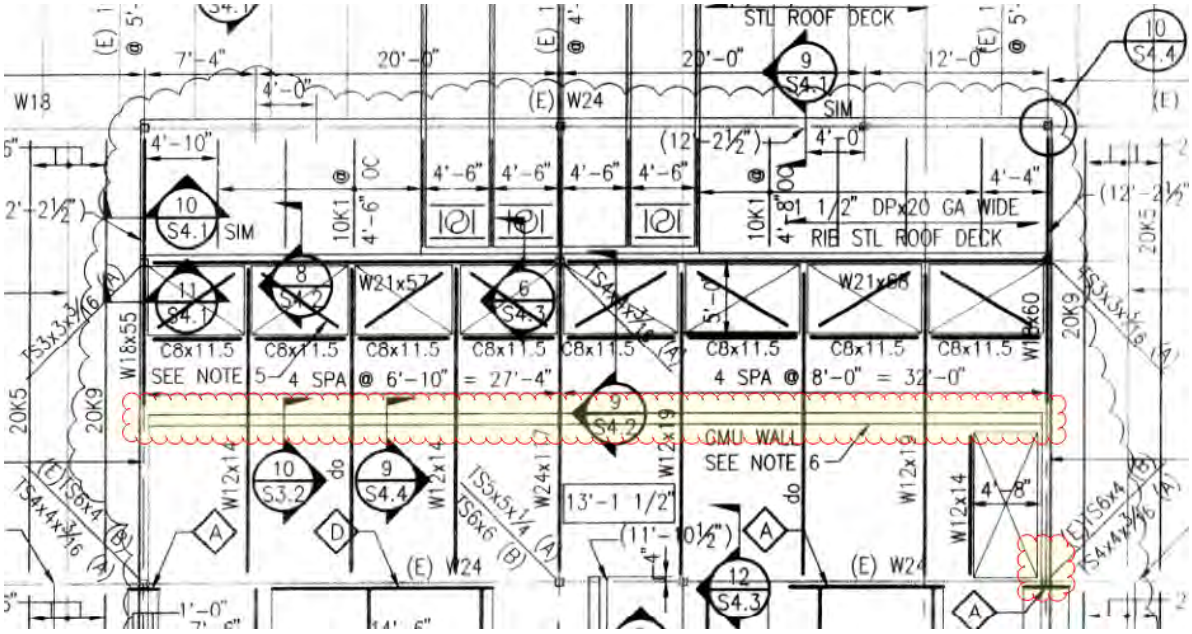


Figure 9 - Central mechanical floor, 1999 renovation and addition drawings, sheet S2.3. The CMU to beam connection in question is clouded.

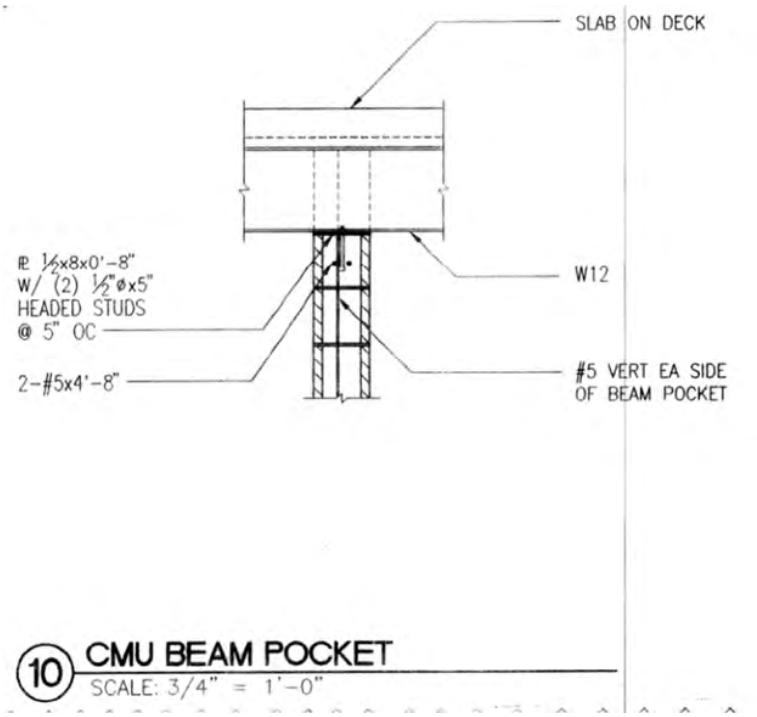


Figure 10 - Detail 10 on S3.2 of the 1999 Addition drawings.

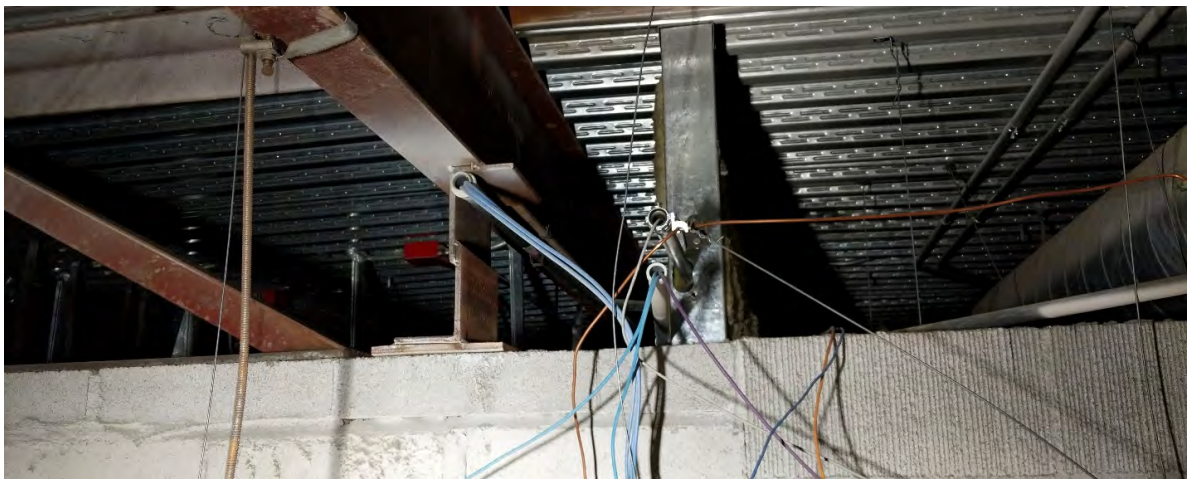


Figure 11 – Top of CMU wall as-built condition. Note that this differs from what is shown in detail 10/S3.2 of the design drawings.

6 TIER – 1 SEISMIC EVALUATION

The seismic evaluation was conducted in accordance with the Tier - 1 method of ASCE 41. The evaluation process consists of a set of screening checklists which aim to evaluate the seismic performance of the building. The main purpose of the screening checklists is to efficiently identify elements of the *LFRS* that may not be adequate. The following structural and non-structural screening checklists were completed:

17.1.2	*Basic Configuration Checklist*
17.10	*Structural Checklist for Building Types S2 and S2a*
17.34	*Structural Checklist for Building Types RM1 and RM2*
16.17	*Non-Structural Checklist*

To properly evaluate the Tier-1 checklists for a damage control limit state the quick-checks utilize reduced *m*-values, which represent the expected ductility demands. The above checklists represent a lower bound acceptance criteria. An element of the LFRS which fails to meet the checklist criteria is not necessarily deficient. However, such elements must be investigated further to determine the overall seismic performance of the building. The completed checklists can be found in full in Appendix – B.

Checklist: Basic Configuration

The aim of the basic configuration checklist is to identify any irregularities in the building configuration or supporting soil that would adversely affect the building's seismic performance. The checklist is based upon observed damage during actual earthquakes. All non-conforming aspects of this checklist are given in Table 9.

Table 9 - Components not in conformance with the basic configuration checklist.

17-1 – Basic Configuration Checklist	
Checklist Description	**Non - Conforming Elements**
Vertical Irregularity (A2.2.4)	The North brace frame of the 1999 Mechanical penthouse addition does not align with a vertical LFRS element below.
Liquefaction (A.6.1.1)	Liquefaction of the soil supporting the building is possible, based on the limited geotechnical information available.

Checklist: Collapse Prevention Checklist for Building Type S2a: Steel Braced Frames with Flexible Diaphragms.

The aim of this checklist is to identify any issues specific to the steel braced frames, roof diaphragms, and associated connections central mechanical penthouse addition from 1999. All non-conforming aspects of this checklist are given in Table 10.

Table 10 – Components not in conformance with the damage control structural checklist for building type S2a

17.10 – Structural Checklist for Building Type S2a	
Checklist Description	**Non - Conforming Elements**
Column Axial Stress (A.3.1.3.2)	The axial stress in columns subjected to overturning forces exceeds the threshold based on the quick-check procedure and the gravity load limit.
Connection Strength (A.3.3.1.5)	The brace to gusset plate connection is not capable of resisting the brace yield force. Reference detail 1/S4.3 of the 1999 Renovation and addition drawings.
Chevron Bracing (A.3.3.2.3)	Chevron beams are not capable of resisting the vertical load resulting from simultaneous yielding and buckling of braces.
Concentrically Braced Frame Joints (A.3.3.2.4)	Brace line of action does not align with the coincident of the column and beam centerlines of the Northeast brace to beam connection at the mechanical penthouse floor level. Reference detail 4/S4.3 of the 1999 renovation and addition drawings

Checklist: Collapse Prevention Checklist for Building Type RM1: Reinforced Masonry Bearing Walls with Flexible Diaphragms.

The aim of this checklist is to identify any issues specific to the reinforced masonry shear walls, floor and roof diaphragms, and associated connections. All non-conforming aspects of this checklist are given in Table 11.

Table 11 – Components not in conformance with the damage control structural checklist for building types RM2

17-34 – Structural Checklist for Building Types RM1	
Checklist Description	**Non - Conforming Elements**
Wall Anchorage (A.5.1.1)	Several connections for exterior CMU walls perpendicular to joists have inadequate strength to resist the out-of-plane force required by the Tier – 1 quick-checks.
Wood Ledgers (A5.1.2)	The connection between the CMU wall and the plywood storage floor deck in Room 405/406 puts the wood ledger in cross-grain bending. Reference detail 4/S5 of the original building drawings.

Seismic Performance Assessment: ASD Scale

The seismic performance of the structure, at the BSE-1N hazard level is estimated to be below the ASD target of damage control. This assessment should be considered approximate as it is based on engineering judgement and Tier 1 screening checklists.

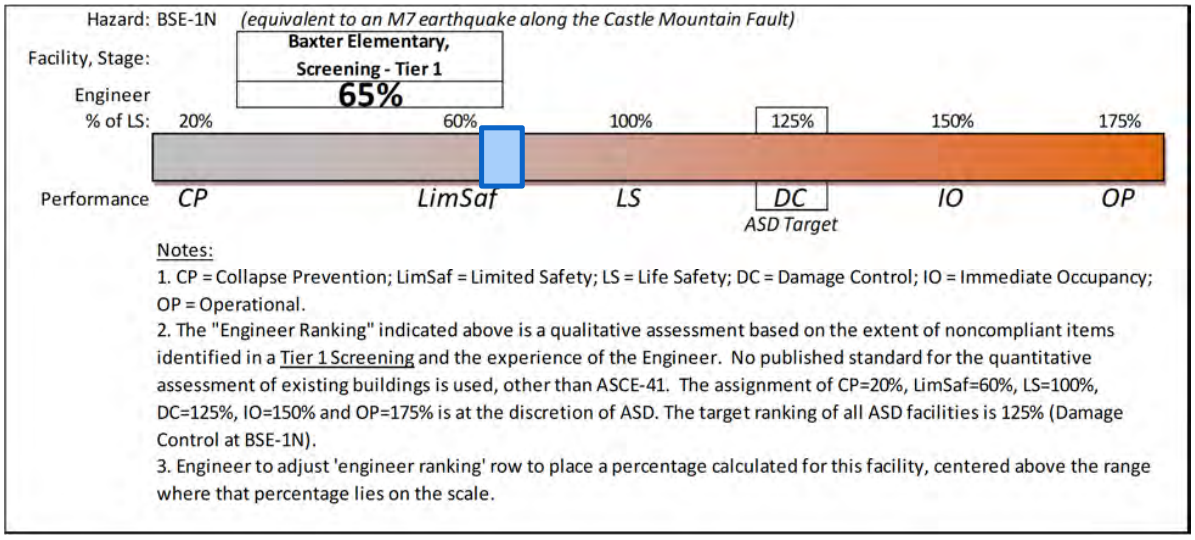


Figure 12 - Seismic performance Assessment Scale at BSE-1N per ASD Design Guide Appendix 3.

Checklist: Nonstructural Components

The aim of the non-structural checklist is to identify any non-structural components that are likely to fail or malfunction during an earthquake which could cause harm to the building occupants. All non-conforming or unknown aspects of this checklist are given in Table 13.

7 SUMMARY OF FINDINGS

The evaluation process consists of a set of screening checklists which aim to evaluate the seismic performance of the building. The LFRS of the building was evaluated against the structural checklists for the damage control performance goals. The non-structural components, e.g. architectural, mechanical, and electrical equipment, were evaluated against the non-structural checklist for the position retention performance goal.

Structural Components

Based on the site visit by PDC, the LFRS does not appear to have significant damage or deterioration. The structure has a defined seismic load path and has sufficient shear wall length to meet the required performance objectives. However, several non-conforming elements were identified during the evaluation. A summary of the non-conforming items, severity, and schematic retrofits are detailed in Table 12.

The potential for liquefaction exists. Liquefaction of the soil supporting the building may lead to significant damage and prevent the performance objectives from being reached. Our evaluation for liquefaction is based on information from adjacent sites, as no geotechnical information was available for this site. Obtaining adequate soil bore logs, either from the original construction and addition, or from a new soils investigation will more clearly define the risk of liquefaction. An additional benefit is a refinement of the soil site class from the default, which could lead to a reduction in seismic forces by up to 20 percent.

Several non-conforming elements were observed in the 1999 Addition portions of the building. The connections of the roof joists to the CMU walls providing out of plane support to the walls did not meet the Tier – 1 strength requirements. The braced frame system supporting the central mechanical penthouse story has multiple elements which do not meet the checklist criteria. This story is relatively lightly loaded and does not support a story above. Given this, many of the elements of the braced frame may meet the performance requirements under a Tier – 2 evaluation.

The top of the CMU shear wall at the south end of the library differs considerably from the design drawings, discussed in section 5 and shown in Figure 11. The CMU wall was added as part of the 1999 Addition. Based on the condition at the top of the wall, we excluded it in our CMU shear stress check. However, the wall does appear to have some connection to the central penthouse floor deck. It is a relatively rigid element supporting a concrete floor deck and will likely resist seismic load. The as-built wall to deck connections should be evaluated and upgraded as required to prevent damage to the top of the wall.

Non - Structural Components

The sprinkler system appeared to be braced appropriately, however their was inadequate clearance around the sprinkler heads where they penetrate the ceiling grid. All other distribution systems lack adequate bracing and support to meet the conformance requirements of the Tier - 1 checklists. The suspended ceiling system, some classroom lights, and emergency lighting were generally not in conformance. A summary of the non-conforming items, severity, and schematic retrofits are detailed in Table 13.

8 RECOMMENDATIONS & FURTHER ANALYSIS

The seismic evaluation revealed multiple elements of the LFRS that are not expected to achieve the target seismic performance. The Tier – 1 procedure used represents only a rough analysis of the lateral force resisting system of the building.

A Tier – 2 evaluation per ASCE 41 may be used to definitively determine if the building will meet the target seismic performance goals. PDC recommends that the following actions be taken:

1. *Perform a detailed Tier – 2 seismic evaluation focusing on:*
    a. *Evaluation of the potential for liquefaction at the site.*
    b. *Out of plane support for the CMU wall anchors*
    c. *Evaluation of the braced frame supporting the central penthouse story*
    d. *Documentation and Evaluation of the south library wall discussed in Section 5*
2. *Perform a more focused site visit & review all available documentation for the non-conforming or unknown non-structural components.*
3. *Develop & implement a seismic retrofit plan, as required.*

This evaluation involves a detailed analysis of all components of the building's lateral force resisting system which failed the Tier-1 screening criteria. The results of this analysis may be directly used to develop a cost effective seismic retrofit plan. Any seismic retrofit plan could be tailored to the level of seismic performance desired.

21156AN Baxter Elementary **March 2022**
Seismic Evaluation **Tier – 1 Report**

Table 12 - Summary of LFRS elements not in conformance with the Tier - 1 checklists.

Number	Problem	Location	Description	Potential Consequences	Schematic Retrofit [a]	Further Evaluation Required? [b]	Priority Ranking [c]
1	**Liquefaction**	Entire building.	The soil supporting the building may liquefy during severe shaking.	Loss of soil bearing strength resulting in damage to the LFRS and VFRS.	No site-specific geotechnical information was available. Obtain the necessary geotechnical information to make a real estimate of the liquefaction potential and if retrofits are needed. Possible retrofits include interconnecting foundation elements or soil improvements.	**YES**	**75**
2	**Wall Anchorage**	Detail 5/S4.1 (1999) • High roof, grid M • Main roof at Areas A & B, grids 1 and 12 • South penthouse low roof, grid K • High roof at grid L	Connections providing out of plane support for the CMU walls do not meet the strength requirements of the Tier-1 checklist.	The CMU wall may become damaged and or separated from the metal deck diaphragm.	Install additional anchor hardware at the existing joist to CMU wall connection as needed to improve the strength of the connection.	**YES**	**45**
3	**Compact Members: Brace Compactness**	1999 Central mechanical penthouse braced frames.	The brace members do not meet the ductility requirements of the Tier-1 checklists. (AISC 341-16 moderately ductile members)	The energy dissipation of the brace may be limited by pre-mature rupture of the brace during out of plane buckling. This may lead to loss of strength and stiffness of the LFRS supporting the central mechanical penthouse roof.	Infill the existing brace with a non-shrink grout or concrete. Alternatively, the brace section may be cut out and replaced with a new brace.	**YES**	**15**
4	**Column Axial Stress**	1999 Central mechanical penthouse braced frames.	The axial strength of the braced frame columns do not meet the Tier-1 threshold for overturning or gravity loads.	The braced frame columns may be damaged during an earthquake, limiting the ability of the braced frame to dissipate seismic energy.	Reinforce the existing HSS3x3x3/16 columns with steel cover plates as necessary based on more refined loading from a Tier-2 evaluation.	**YES**	**15**
5	**Connection Strength**	1999 Central mechanical penthouse braced frames.	The brace to gusset connection does not have enough capacity to resist yielding of the brace.	A premature failure of the brace to gusset connection may occur, limiting the ability of the braced frame to dissipate seismic energy.	Strengthen the connections of the braced frame with additional welds and steel reinforcing as necessary, based on more refined loading from a Tier-2 evaluation.	**YES**	**15**
6	**Chevron Bracing**	1999 Central mechanical penthouse braced frames.	The chevron beams at all braced frames do not have adequate strength to resist simultaneous buckling and yielding of the braces.	Premature failure of the beam may occur, limiting the ability of the braced frame to dissipate seismic energy.	Reinforce the existing beam as necessary to achieve the strength required by a Tier-2 evaluation. Retrofits may include welding steel cover plates to the existing beam.	**YES**	**15**
7	**Concentrically Braced Frame Joints**	1999 Central mechanical penthouse braced frame Northeast corner (Grid 7.2-C.2)	The braced frame connection to the supporting girder is not concentric. Detail 4/S4.3 of the 1999 renovation drawings.	Damage may occur in the beam to girder connection.	Increase the strength of the connection between the beam and girder with additional steel plates and welding as necessary.	**YES**	**15**
8	**Wood Ledgers**	Room 405/406 at storage mezzanine	The floor anchorage to the CMU wall puts the wood ledger in cross grain bending, reference detail 4/S5 of the original building drawings.	Separation of the floor and CMU wall resulting in a loss of vertical support for the storage room floor.	Install new out of plane anchors at every few floor joists. Anchors may be as standard wood hold down with a thru-bolt through the existing CMU wall.	**NO**	**15**
9	**Vertical Irregularity**	1999 Central mechanical penthouse, North braced frame.	The braced frame does not align with a vertical LFRS element below & relies on the diaphragm to transfer loads to offset LFRS elements.	The diaphragm may be damaged and not transfer the load from the braced frame to the offset CMU shear walls below, resulting in a loss of strength at this braced frame.	Evaluate the diaphragm transfer forces with a Tier-2 evaluation and install horizontal braces as required to develop the load into the diaphragm.	**YES**	**10**

a) Schematic retrofits are conceptual and approximate.
b) A Tier 2 or 3 analysis is required to determine if the element in question is sufficient or not.
c) For a full derivation of the priority ranking, see Appendix A.

21156AN Baxter Elementary **March 2022**
Seismic Evaluation **Tier – 1 Report**

Table 13 - Summary of Non-Structural elements not in conformance with the Tier - 1 checklists.

Number	Problem	Location	Description	Potential Consequences	Schematic Retrofit [d]	Priority Ranking [e]
1	**Emergency Lighting**	Systemic, see C-24 corridor for example. See Figure 37.	In some locations the emergency lighting is only attached to the suspended ceiling grid system and has not bracing.	The lights may fall from the ceiling grid causing a falling hazard and loss of emergency lighting at exits.	Install independent supports for lighting.	100
2	**Hazardous Material Distribution (Natural Gas Piping): Bracing**	Systemic. See Figure 41 and Figure 44.	Natural gas piping is not braced.	Piping system may become damaged causing a natural gas leak.	Install bracing as required by modern codes for the natural gas piping system.	100
3	**Flexible Couplings (Natural Gas Piping)**	Systemic. See Figure 24.	Natural gas piping is composed of segments of pipe rigidly attached together.	Piping system may become damaged causing a natural gas leak.	Install flexible couplings as required by modern codes.	100
4	**Fire Suppression: Flexible Couplings**	Systemic	Fire suppression piping is composed of segments of pipe rigidly attached together.	Piping system may become damaged causing water leaks and inadequate pressure for fire suppression system.	Install flexible couplings as required by modern codes.	100
5	**Fluid and Gas Piping: Bracing**	Systemic	The water piping distribution systems are not braced.	Piping may become damaged causing water leaks.	Install bracing for water distribution system as required by modern codes.	50
6	**Fluid Piping: C-Clamps**	Systemic. See Figure 30.	The water piping distribution systems supported with C-clamps that do not have restraining straps.	Piping may become damaged causing water leaks.	Install retainer straps at C-clamps for all piping which exceeds 2.5” in diameter.	50
7	**Fluid Piping – Flexible Connections**	Systemic	Fluid and Gas Piping missing flexible couplings.	Piping system may become damaged causing a leak.	Install flexible couplings as required by modern codes.	50
8	**Furnishings Tall Narrow Contents**	Multiple classrooms, see room 207 for example.	Filing cabinets were not anchored to the structure.	The tall narrow furnishings may fall over, impeding egress.	Anchor the tall narrow contents to the structure to prevent overturning.	40
9	**Sprinkler Ceiling Clearance**	Systemic. See Figure 43.	The sprinkler heads do not have adequate clearance around the suspended ceiling tiles.	Damage to the sprinkler and suspended ceiling system.	Provide adequate clearance at sprinkler heads or install flex pipe between service laterals and sprinkler heads.	20
10	**Ceiling Edge Clearance**	Systemic	The free edges of the suspended ceilings do not have the required ¾” clear distance to the enclosing walls	Damage to the suspended ceiling system causing ceiling tiles to fall from the grid.	Retrofit free edges of ceiling system to include a ¾” gap and a 2” support angle.	20
11	**Ceiling Edge Support**	Systemic	The free edges of the suspended ceiling system do not have a 2” angle support.			20
12	**Light Fixture Supports**	Systemic, Corridor C24 as an example. See Figure 33.	Some light fixtures were only supported by the suspended ceiling system.	Light fixtures may fall from the ceiling grid.	Install diagonally opposing supports at non-conforming light fixtures.	20
13	**Lens Covers**	Systemic	Some light fixtures are missing lens retention covers.	Lens covers and or light bulbs may fall from lights.	Install lens cover restraining clips or replace lights with conforming fixtures.	20
14	**Partition Walls**	1999 Addition, see reflected ceiling plans for locations marked.	Some partition walls do not extend to the roof deck, no bracing appears to be provided and walls may be supported by the ceiling grid.	Wall may damage the ceiling grid and or collapse.	Provide bracing at top of the wall.	20
15	**Hazardous Material Storage**	Storage room 603	Hazardous and flammable material as stored in a tall narrow cabinet which does not appear to be anchored to the structure	Hazardous contents may leak.	Anchor the cabinet to the structure.	10
16	**Conduit Couplings**	Systemic, example at the south penthouse, Figure 46.	Conduit does not have a flexible coupling	Damage to the electrical components may occur.	Install a flex connection at the conduit to equipment locations.	10
17	**Duct Bracing**	Systemic. See Figure 36.	Ducts were not braced.	Damage to ducts resulting in a loss of function and fall hazard.	Install duct bracing.	10
18	**Stair Connection Details**	All stair locations	The stairs do not appear to be detailed to accommodate the required story drift for the Tier 1 checklists.	Damage to the stairs may occur.	Investigate the stair connection and differential displacement demand. Potential retrofits may include providing an oversize hole at the stair base connection.	10

19	**Mechanical & Electrical Fall-prone Equipment**	Mechanical penthouses and sprinkler valve control room. See Figure 38 and Figure 39.	Unit heaters are not braced.	Damage to unit heaters, resulting in loss of function, water leaks, and fall hazard.	Install bracing in each direction for unit heaters.	6
20	**Pendant Supports**	Sprinkler valve control room. See Figure 38.	Pendant lighting is not free to swing without impacting adjacent equipment.	Damage to pendant lighting.	Brace pendant lighting.	4
21	**In-line Equipment**	Boiler room. See Figure 35.	Large in-line pumps are only braced by the in-line piping systems.	Damage to the piping system causing a loss of function.	Evaluate the in-line equipment to determine if bracing is required, if so, install new bracing.	4
22	**Weep Holes**	Exterior assembly V20, 1999 Addition. See Figure 45.	No weep holes were observed during the site visit	Water damage may occur due to moisture build-up behind masonry veneer.	Add weep holes as necessary to sections of wall assembly type V20.	0
23	**(U) Gypsum Board ceiling bracing**	All locations where gypsum board ceiling occurs	Bracing for gypsum board ceilings could not be verified through a review of available drawings or seen on site without removing finishes.	Damage to the gypsum board ceiling creating a falling hazard.	Remove finishes as required in multiple locations to determine if bracing is present. If it is not, install new bracing for the ceiling.	0
24	**(U) Tracks supporting masonry veneer**	Exterior assembly V20, 1999 Addition	Anchorage for veneers could not be verified through review of available drawings or observed on site without removing finishes.	Damage to connection at veneer to metal studs creating a falling hazard.	Remove veneer as required in multiple locations to determine anchorage. If anchorage is non-compliant, install additional anchors to meet modern code.	0
25	**(U) Glazing is laminated annealed**	Arch at school entrance	Two (2) large glass curtain walls are at the front and rear of the arch at the school entrance. Through review of available drawings, it is unknown if the glass is laminated annealed.	Damage to the curtain wall could shatter the glass creating a fall and egress hazard.	Test glazing to determine if laminated annealed. Replace glazing as necessary to use only laminated annealed.	0

d) Schematic retrofits are conceptual and approximate.
e) For a full derivation of the priority ranking, see Appendix A.
f) (U) indicates that the component is unknown

9 SITE VISIT PHOTOS

Figure 13 – Main entrance to the school, Southwest elevation.

Figure 14 – Boiler room and storage, Southwest elevation.

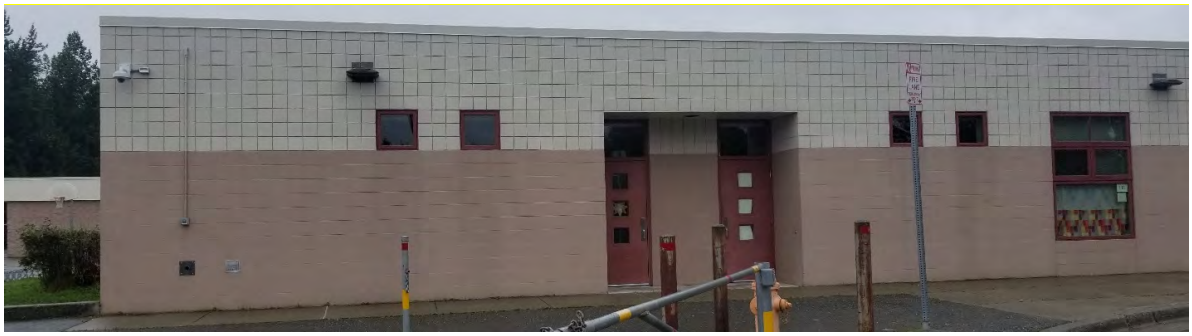


Figure 15 – Exterior elevation, West side.

Figure 16 - South Mechanical penthouse and multi-purpose room.

Figure 17 – Multi-purpose room and south mechanical penthouse.

Figure 18 – Exterior elevation, East side.

Figure 19 – Exterior elevation, North Side.

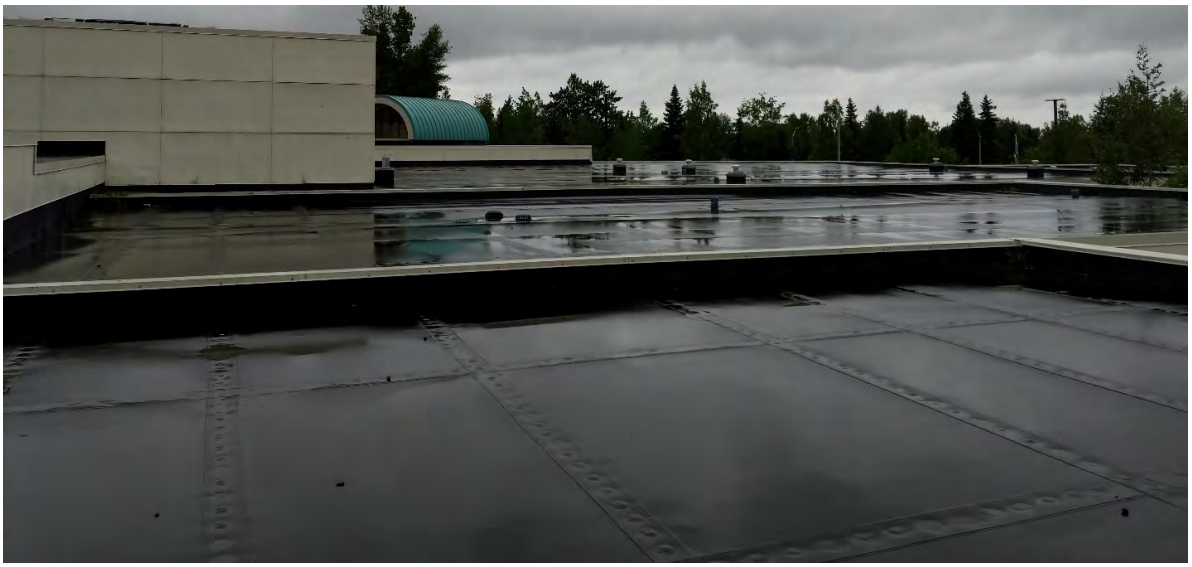


Figure 20 - Typical low roof observed from the West side.

Figure 21 – Roof at the main entrance to the school.

Figure 22 - Typical roof joist to CMU shear wall connection at the South mechanical penthouse.

Figure 23 – Damage to the CMU shear wall in the South penthouse near grids H-7 of the 1999 Renovation and Addition drawings. Damage appears to be related to the installation of the mechanical duct shown in this figure.

Figure 24 - Exterior natural gas connection to the building and seismic shut-off valve.

Figure 25 – Roof joist to CMU wall connection, located in the Boiler Room.

Figure 26 – Damage or incomplete grouting at the beam to CMU wall connection, located near the stairway in the central mechanical penthouse.

Figure 27 – Cracking in the slab on metal deck located near the stairway to the central mechanical penthouse.

Figure 28 - Typical Ceiling Grid Bracing and typical C-Clamps with Retaining-Straps at wide flange beams.

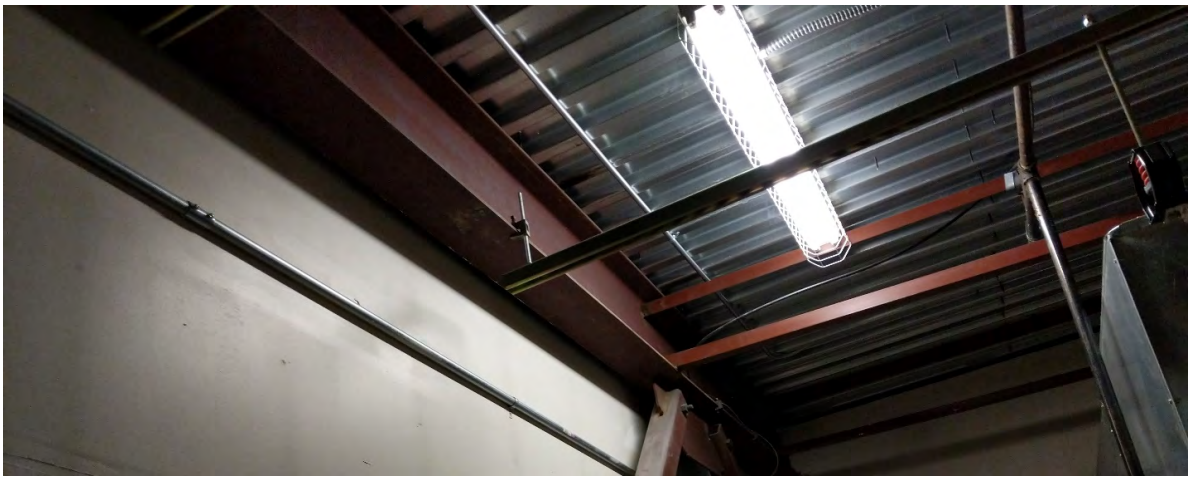


Figure 29 - C-clamps missing retaining straps at the new central mechanical penthouse.

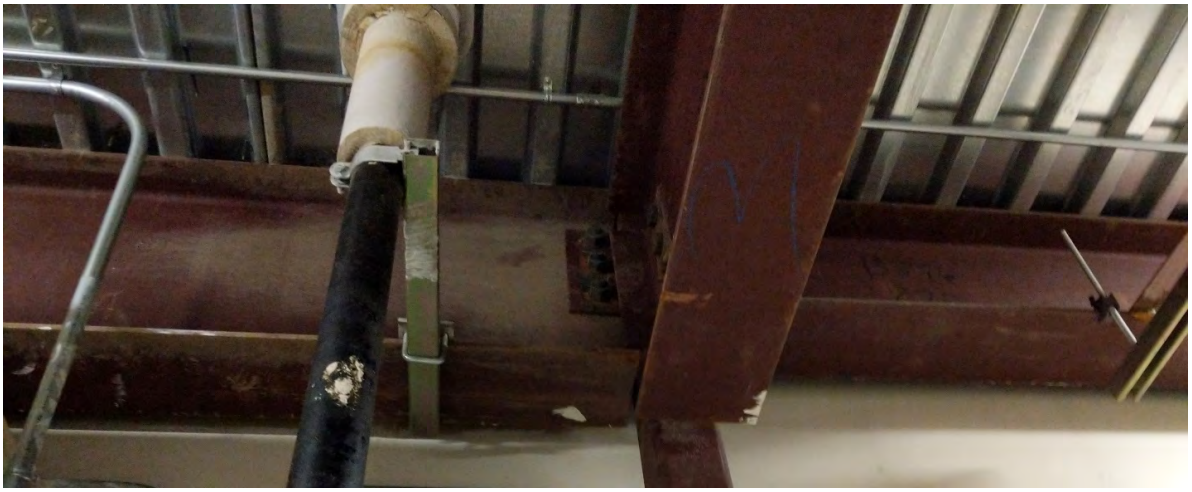


Figure 30 - Clamps missing retaining straps at the new central mechanical penthouse.

Figure 31 – Glycol expansion tank without adequate restraints, at the central mechanical penthouse.

Figure 32 - Typical conduit to panel without flexible connections, at the South mechanical penthouse.

Figure 33 - Non-compliant light supports, above ceiling in corridor C-24.

Figure 34 - Exterior cladding at top of CMU wall, typical at 1999 additions.

Figure 35 - Unbraced in-line pumps, located in the boiler room.

Figure 36 - Unbraced ducting, located in the South mechanical penthouse.

Figure 37 – Non-complaint bracing for emergency lighting above ceiling tile in corridor C-24.

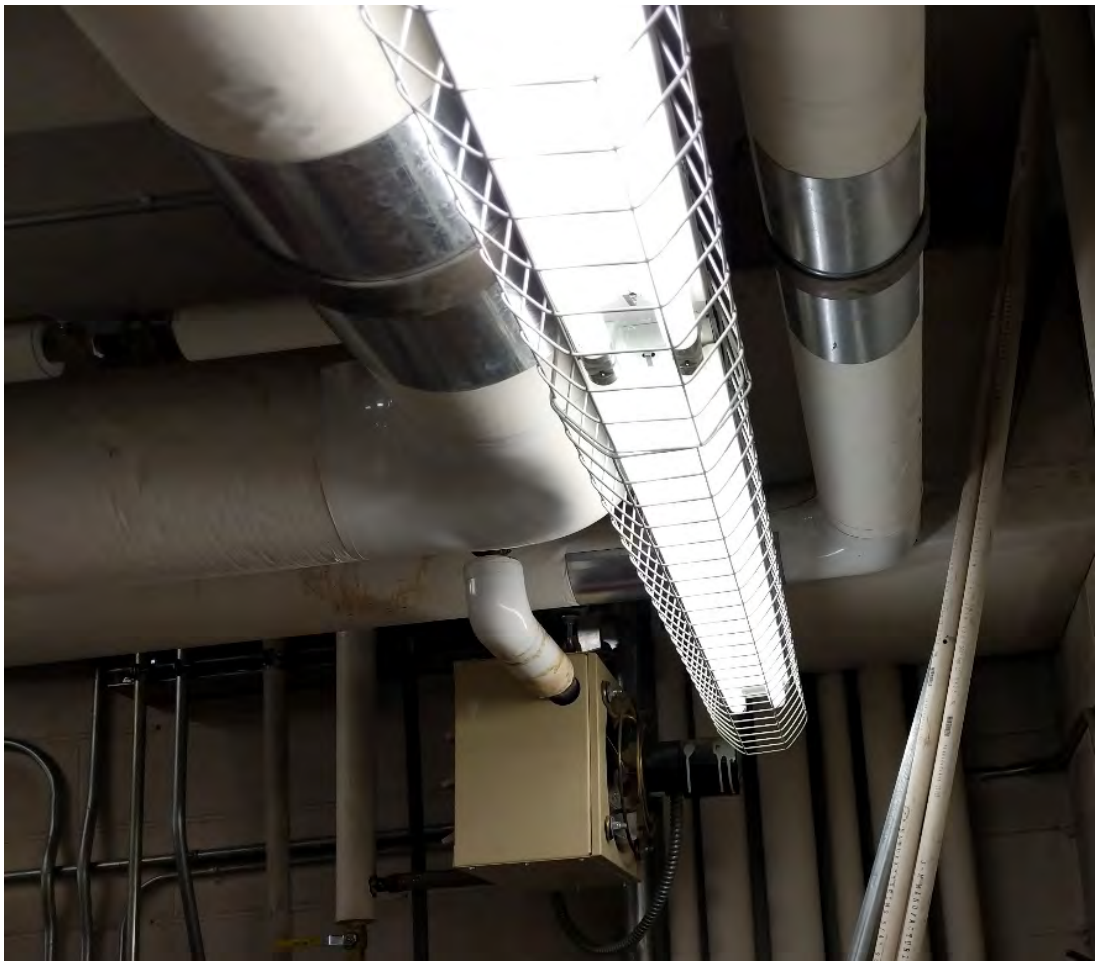


Figure 38 - Impact prone pendant lighting and unbraced unit heater, located in the sprinkler control valve room.

Figure 39 - Unbraced unit heater, located in the South mechanical penthouse.

Figure 40 – Typical bracing at fire suppression piping mains.

Figure 41 - Unbraced natural gas line, located in the boiler room.

Figure 42 - Braced fire suppression mains, located in the sprinkler control valve room.

Figure 43 – Sprinkler heads without adequate clearance or flexible Line, typical of all locations.

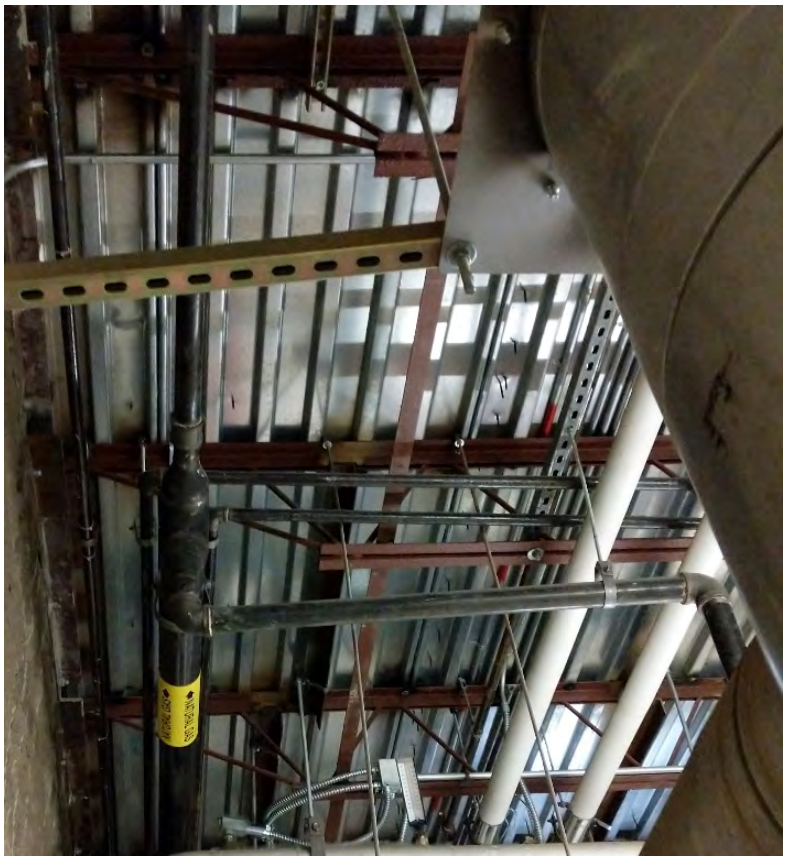


Figure 44 – Gas lines with no seismic bracing, located in the boiler room.

Figure 45 - Typical veneer attached to stud wall in previous opening without weep holes, occurring at various locations around the building. Photo location is at East side.

Figure 46 - Electrical conduit subject to relative displacements and lacking flex connections, located in the south mechanical room.

APPENDIX A

RELATIVE PRIORITY RANKING OF TIER 1 DEFICIENCIES

Baxter Elementary School **March 2022**

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
Entire Building	17.1	1 - Liquefaction	5	5	3	75
1999 Addition	17.17	2 - Wall Anchorage	5	3	3	45
Mechanical Penthouse - Central	17.5	3 - Compact Members - Brace compactness	5	1	3	15
Mechanical Penthouse - Central	17.5	4 - Column Axial Stress	5	1	3	15
Mechanical Penthouse - Central	17.5	5 - Brace connection strength	5	1	3	15
Mechanical Penthouse - Central	17.5	6 - Chevron Beam Strength	5	1	3	15
Mechanical Penthouse - Central	17.5	7 - Concentrically braced frame Joints	5	1	3	15
Music Room 405/406	17.17	8 - Wood ledgers	5	1	3	15
Mechanical Penthouse - Central	17.1	8 - Vertical Irregularity	5	1	2	10

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.

Baxter Elementary School **March 2022**

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**	**Number**	**Item**	**Deficiency**	**Prevalence**	**Threat**	**Priority Rating**
Non-Structural - All Sections	17.19	1	Emergency Lighting	5	5	4	100
Non-Structural - All Sections	17.19	2	Hazardous Material Distribution: Natural Gas Piping - Bracing	5	5	4	100
Non-Structural - All Sections	17.19	3	Flexible Couplings - Natural Gas Piping	5	5	4	100
Non-Structural - All Sections	17.19	4	Fire Suppression Piping - Flexible Couplings	5	5	4	100
Non-Structural - All Sections	17.19	5	Fluid and Gas Piping - Bracing	5	5	2	50
Non-Structural - All Sections	17.19	6	Fluid Piping - C-Clamps missing retainer straps	5	5	2	50
Non-Structural - All Sections	17.19	7	Fluid piping - Flexible connections	5	5	2	50
Non-Structural - All Sections	17.19	8	Furnishings Tall Narrow Contents	2	5	4	40
Non-Structural - All Sections	17.19	9	Sprinkler Ceiling Clearance	2	5	2	20
Non-Structural - All Sections	17.19	10	Ceiling Edge Clearance	2	5	2	20
Non-Structural - All Sections	17.19	11	Ceiling Edge Support	2	5	2	20
Non-Structural - All Sections	17.19	12	Light Fixture Supports	5	2	2	20
Non-Structural - All Sections	17.19	13	Lens Covers	2	5	2	20
Non-Structural - All Sections	17.19	14	Partition wall tops	5	2	2	20
Non-Structural - All Sections	17.19	15	Hazardous Material Storage	5	1	2	10
Non-Structural - All Sections	17.19	16	Conduit Couplings	2	5	1	10
Non-Structural - All Sections	17.19	17	Duct Bracing	2	5	1	10
Non-Structural - All Sections	17.19	18	Stair Connection Details	5	2	1	10
Non-Structural - All Sections	17.19	19	Mech & Elec Fall-prone Equipment	2	3	1	6
Non-Structural - All Sections	17.19	20	Pendant Supports - Lighting	2	2	1	4
Non-Structural - All Sections	17.19	21	In-line Equipment	2	2	1	4
Non-Structural - All Sections	17.19	22	Weep Holes - Masonry Veneer	0	5	1	0
Non-Structural - All Sections	17.19	23	Suspended Gypsum Board (Unknown)	0	0	0	0
Non-Structural - All Sections	17.19	24	Stud Tracks supporting masonry veneer (Unknown)	0	0	0	0
Non-Structural - All Sections	17.19	25	Glazing is laminated annealed -Unknown	0	0	0	0

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.

APPENDIX B

TIER 1 CHECKLISTS

B - 01

ASCE 41-17 Tier 1 Checklists

FIRM:	PDC Engineers
PROJECT NAME:	ASD Tier 1 Seismic Evaluations
SEISMICITY LEVEL:	High
PROJECT NUMBER:	21156AN
COMPLETED BY:	DH / NC
DATE COMPLETED:	10/21/2021
REVIEWED BY:	EDM
REVIEW DATE:	10/21/2021

Legend: C = Compliant, NC = Noncompliant, N/A = Not Applicable, U = Unknown

B - 02

APPENDIX C
SUMMARY DATA SHEET

BUILDING DATA

Building Name: Baxter Elementary School — Date: 10/20/2021
Building Address: 2991 Baxter Road, Anchorage, AK
Latitude: 61°11'35" — Longitude: 149°45'42" — By: DH/NC

Year Built: 1973 — Year(s) Remodeled: 1999 — Original Design Code: 1970 UBC
Area [ft² (m²)]: 58965 — Length [ft (m)]: 365 — Width [ft (m)]: 290
No. of Stories: 2 — Story Height: 13 — Total Height: 24

USE ☐ Industrial ☐ Office ☐ Warehouse ☐ Hospital ☐ Residential ☑ Educational ☐ Other: _____

CONSTRUCTION DATA

Gravity Load Structural System: Reinforced CMU and Steel Columns
Exterior Transverse Walls: Reinforced CMU — Openings? Doors / Windows
Exterior Longitudinal Walls: Reinforced CMU — Openings? Doors / Windows
Roof Materials/Framing: Steel roof deck
Intermediate Floors/Framing: Concrete Slab & Composite metal deck w/ concrete topping
Ground Floor: Concrete Slab-on-grade
Columns: Steel — Foundation: Shallow Fnds
General Condition of Structure: Fair
Levels Below Grade? None
Special Features and Comments:

LATERAL-FORCE-RESISTING SYSTEM

	Longitudinal	Transverse
System:	Reinforced Masony & OCBF	Reinforced Masony & OCBF
Vertical Elements:	Reinforced CMU / Steel Columns	Reinforced CMU / Steel Columns
Diaphragms:	Steel Deck, Concrete SoD / Slab	Steel Deck, Concrete SoD / Slab
Connections:	Braced Frame	Braced Frame

EVALUATION DATA

BSE-1N Spectral Response Accelerations: S_{DS} = 0.943 — S_{D1} = 0.653
Soil Factors: Class = D, Default — F_a = 1.2 — F_v = 1.7
BSE-2E Spectral Response Accelerations: S_{XS} = 1.565 — S_{X1} = 1.018
Level of Seismicity: High — Performance Level: Limited Safety
Building Period: T = 0.22
Spectral Acceleration: S_a = 1.565
Modification Factor: $C_m C_1 C_2$ = 1.0 — Building Weight: W = 3,990 kip
Pseudolateral Force: $V = C_m C_1 C_2 S_a W$ = 6,245 kip

BUILDING CLASSIFICATION: Educational

REQUIRED TIER 1 CHECKLISTS

	Yes	No
Basic Configuration Checklist	☑	☐
Building Type RM Structural Checklist	☑	☐
Nonstructural Component Checklist	☑	☐

FURTHER EVALUATION REQUIREMENT: Yes

Project Name ASD Tier 1 Seismic Eva
Project Number 21156AN

17.1.2CP Basic Configuration Checklist

Table 17-2. Collapse Prevention Basic Configuration Checklist

Status				Evaluation Statement	Tier 2 Reference	Commentary Reference	Comments
Low Seismicity							
Building System—General							
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	
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	
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							
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	
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	
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	Mechanical penthouse - North Brace frame does not align with a vertical LFRS element below.

Legend: C = Compliant, NC = Noncompliant, N/A = Not Applicable, U = Unknown

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	
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	
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	

Status				Evaluation Statement	Tier 2 Reference	Commentary Reference	Comments
Moderate Seismicity (Complete the Following Items in Addition to the Items for Low Seismicity)							
Geologic Site Hazards							
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	See reasoning in section 3 of the report.
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	
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	

Legend: C = Compliant, NC = Noncompliant, N/A = Not Applicable, U = Unknown

B - 05

Project Name ASD Tier 1 Seismic Eva
Project Number 21156AN

Status				Evaluation Statement	Tier 2 Reference	Commentary Reference	Comments
High Seismicity (Complete the Following Items in Addition to the Items for Moderate Seismicity)							
Foundation Configuration							
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	
☒	☐	☐	☐				
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	
☒	☐	☐	☐				

Legend: C = Compliant, NC = Noncompliant, N/A = Not Applicable, U = Unknown

Project Name _____
Project Number _____

17.17CP Structural Checklist for Building Types RM1: Reinforced Masonry Bearing Walls with Flexible Diaphragms and RM2: Reinforced Masonry Bearing Walls with Stiff Diaphragms

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

Status				Evaluation Statement	Tier 2 Reference	Commentary Reference	Comments
Low and Moderate Seismicity							
Seismic-Force-Resisting System							
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	
☒	☐	☐	☐				
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	
☒	☐	☐	☐				
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	
☒	☐	☐	☐				
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	No precast concrete diaphragm elements.
☐	☐	☒	☐				
Connections							
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	Exterior CMU walls parallel to joists have anchorage for shear transfer to diaphragms but not for lateral support. Several connections for exterior CMU walls perpendicular to joists have inadequate strength to resist the out-of-plane force of 4.4.3.7.
☐	☒	☐	☐				
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	1973 Storage mezzanine in the music room. Detail 4/S5 of the original building drawings.
☐	☒	☐	☐				

Legend: C = Compliant, NC = Noncompliant, N/A = Not Applicable, U = Unknown

B - 07

Project Name _____
Project Number _____

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	
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	No precast concrete diaphragm elements.
C	NC	N/A	U				
☒	☐	☐	☐	FOUNDATION DOWELS: Wall reinforcement is doweled into the foundation.	5.7.3.4	A.5.3.5	
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	

Status				Evaluation Statement	Tier 2 Reference	Commentary Reference	Comments
High Seismicity (Complete the Following Items in Addition to the Items for Low and Moderate Seismicity)							
Stiff Diaphragms							
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	
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							
C	NC	N/A	U				
☒	☐	☐	☐	CROSS TIES: There are continuous cross ties between diaphragm chords.	5.6.1.2	A.4.1.2	
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	
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	

Legend: C = Compliant, NC = Noncompliant, N/A = Not Applicable, U = Unknown

B - 08

Project Name _____
Project Number _____

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
☐	☐	☒	☐	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
☐	☐	☒	☐	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
☒	☐	☐	☐	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						
☐	☐	☒	☐	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

Legend: C = Compliant, NC = Noncompliant, N/A = Not Applicable, U = Unknown

Project Name _____
Project Number _____

17.5CP Structural Checklist for Building Types S2: Steel Braced Frames with Stiff Diaphragms and S2a: Steel Braced Frames with Flexible Diaphragms

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

Status				Evaluation Statement	Tier 2 Reference	Commentary Reference	Comments
Low Seismicity							
Seismic-Force-Resisting System							
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	
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	The axial stress in columns subjected to overturning forces exceeds the threshold for the overturning quick-check and the gravity loads.
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							
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	
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	See 1999 DWGs, brace elevations on S2.5. Columns are not directly connected to the foundation. However, the intent of Sec. A.5.3.1 is met as the connections have a full uplift load pat

Status				Evaluation Statement	Tier 2 Reference	Commentary Reference	Comments
Moderate Seismicity (Complete the Following Items in Addition to the Items for Low Seismicity)							
Seismic-Force-Resisting System							
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	
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	

Legend: C = Compliant, NC = Noncompliant, N/A = Not Applicable, U = Unknown

Project Name _____
Project Number _____

Status				Evaluation Statement	Tier 2 Reference	Commentary Reference	Comments
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	
☒	☐	☐	☐				
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							
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	No column splices are shown on record documents.
☐	☐	☒	☐				
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	
☒	☐	☐	☐				
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	The weld detail from 1/S4.3 of the 1999 record drawings for the TS braces does not meet the yield capacity of the diago
☐	☒	☐	☐				
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	The HSS4x4x3/16 & HSS5x5x3/16 braces do not meet the compactness criteria for moderately ductile members.
☐	☒	☐	☐				
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	Beams are not capable of resisting the vertical load resulting from simultaneous yielding and buckling of braces.
☐	☒	☐	☐				
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	Northeast corner grid 7.2-C.2, reference 1999 Renovation detail 4/S4.3.
☐	☒	☐	☐				
Diaphragms (Stiff or Flexible)							
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							
C	NC	N/A	U	CROSS TIES: There are continuous cross ties between diaphragm chords.	5.6.1.2	A.4.1.2	
☒	☐	☐	☐				

Legend: C = Compliant, NC = Noncompliant, N/A = Not Applicable, U = Unknown

Project Name _____
Project Number _____

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	No wood diaphragms.
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	No wood diaphragms.
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	No wood diaphragms.
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	

Legend: C = Compliant, NC = Noncompliant, N/A = Not Applicable, U = Unknown

Project Name _____
Project Number _____

17.19 Nonstructural Checklist

Table 17-38. Nonstructural Checklist

Status				Evaluation Statement[a,b]	Tier 2 Reference	Commentary Reference	Comments
Life Safety Systems							
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	
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	Fire suppression couplings are rigid.
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	
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	
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	Neither adequate clearance nor flexible lines are provided
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	Attached only at the ceiling tiles without bracing
Hazardous Materials							
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	
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	Hazardous materials storage cabinet not braced at exterior storage area.
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	Natural gas lines lack adequate bracing.
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	An exterior seismic shut-off valve was observed at the gas meter.
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	Flexible couplings were not observed on natural gas lines.

Legend: C = Compliant, NC = Noncompliant, N/A = Not Applicable, U = Unknown

Project Name _____
Project Number _____

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	No seismic joints.
Partitions							
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	
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	
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	
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	
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	
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	Multiple walls in 1999 Addition. See RCP plans & 5/A6.6
Ceilings							
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	
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	Not observed above gypsum ceilings, destructive demo required.

Legend: C = Compliant, NC = Noncompliant, N/A = Not Applicable, U = Unknown

Project Name _____
Project Number _____

C	NC	N/A	U				
☒	☐	☐	☐	**HR—not required; LS—not required; PR—MH.** INTEGRATED CEILINGS: Integrated suspended ceilings with continuous areas greater than 144 ft² (13.4 m²) 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	Ceiling grids are restrained with diagonal wires and compression struts.
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 ft² (13.4 m²) 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	Free edges do not have adequate clearances.
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	No joints were observed.
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 ft² (13.4 m²) are supported by closure angles or channels not less than 2 in. (51 mm) wide.	13.6.4	A.7.2.6	Closure angles or channels 2" or greater were not observed.
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 ft² (232.3 m²) and has a ratio of long-to-short dimension no more than 4-to-1.	13.6.4	A.7.2.7	No joints were observed.
Light Fixtures							
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	Some lights are only supported by the grid ceiling suspension system.

Legend: C = Compliant, NC = Noncompliant, N/A = Not Applicable, U = Unknown

Project Name _____
Project Number _____

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	Various unbraced pendant supported lights can impact adjacent equipment.
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	Various lights are missing lens covers.
Cladding and Glazing							
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	
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	
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	

Legend: C = Compliant, NC = Noncompliant, N/A = Not Applicable, U = Unknown

Project Name _____
Project Number _____

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
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
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
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
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						
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
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
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

Legend: C = Compliant, NC = Noncompliant, N/A = Not Applicable, U = Unknown

Project Name _____
Project Number _____

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	
☐	☐	☐	☒	**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	No information observable in-field and no details in record drawings. Absent destructive observation
☐	☐	☒	☐	**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	
☐	☒	☐	☐	**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	Exterior assembly V20
☐	☐	☒	☐	**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	Openings not observed to occur at metal stud walls.
Parapets, Cornices, Ornamentation, and Appendages							
☐	☐	☒	☐	**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	No URM parapet.
☒	☐	☐	☐	**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	
☐	☐	☒	☐	**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	
☐	☐	☒	☐	**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	Entry arch treated as canopy.

Legend: C = Compliant, NC = Noncompliant, N/A = Not Applicable, U = Unknown

Project Name _____
Project Number _____

Masonry Chimneys							
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	
☐	☐	☒	☐				
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							
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	
☐	☐	☒	☐				
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	No stair connection information was available & the connection could not be observed.
☐	☒	☐	☐				
Contents and Furnishings							
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	
☐	☐	☒	☐				
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	Several filing cabinets not anchored to structure.
☐	☒	☐	☐				
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	None observed.
☒	☐	☐	☐				

Legend: C = Compliant, NC = Noncompliant, N/A = Not Applicable, U = Unknown

Project Name _____
Project Number _____

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	
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	
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							
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	Several unit heaters are unbraced.
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	Large pumps in boiler room are unbraced independent of piping system.
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	
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	
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	Unbraced unit heaters are free to swing without damage.
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	Vibration isolators were only observed on unit heaters. Unit heaters were also equipped with ver
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	

Legend: C = Compliant, NC = Noncompliant, N/A = Not Applicable, U = Unknown

Project Name _____
Project Number _____

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	
☐	☒	☐	☐	**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	Large diameter conduit was not attached with flexible couplings or connections.
Piping							
☐	☒	☐	☐	**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	Fluid and Gas piping missing flexible couplings
☐	☒	☐	☐	**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	Supply water and gas piping not braced.
☐	☒	☐	☐	**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	Several clamps missing retaining straps.
☐	☐	☒	☐	**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							
☐	☒	☐	☐	**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	Large ducting is unbraced in penthouse levels.
☒	☐	☐	☐	**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	
☐	☐	☒	☐	**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							
☐	☐	☒	☐	**HR—not required; LS—H; PR—H.** RETAINER GUARDS: Sheaves and drums have cable retainer guards.	13.7.11	A.7.16.1	
☐	☐	☒	☐	**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	

Legend: C = Compliant, NC = Noncompliant, N/A = Not Applicable, U = Unknown

Project Name _____
Project Number _____

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
☐	☐	☒	☐	**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
☐	☐	☒	☐	**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
☐	☐	☒	☐	**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
☐	☐	☒	☐	**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
☐	☐	☒	☐	**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
☐	☐	☒	☐	**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

[a] Performance Level: HR = Hazards Reduced, LS = Life Safety, and PR = Position Retention.
[b] Level of Seismicity: L = Low, M = Moderate, and H = High.

Legend: C = Compliant, NC = Noncompliant, N/A = Not Applicable, U = Unknown

APPENDIX C

STRUCTURAL EVALUATION CALCULATIONS

Table of Contents

C - 01

1.0 – SEISMIC LOADING:

Project:
21156AN - ASD Tier 1
Baxter Elementary - Typical Building Weights

C - 02
Name: NIC
Date: 10/25/2021

1.0 Mechanical Floor:

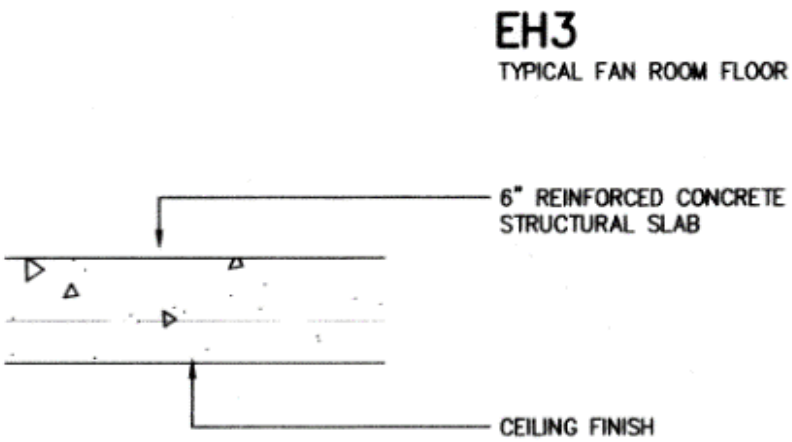
Load Category	Item	Weight *(psf)*	Comment
Dead	7" Concrete Slab	87.50	
	Multiplier	1.00	
Dead	**Total**	**87.50**	**Summary**

Project:
21156AN - ASD Tier 1
Baxter Elementary - Typical Building Weights

C - 03
Name: NIC
Date: 10/25/2021

2.0 Typical Original Building Mechanical Floor Weight:

Load Category	Item	Weight (psf)	Comment
Dead	6" Concrete Slab	75.00	
	Multiplier	1.00	
Dead	**Total**	**75.00**	**Summary**



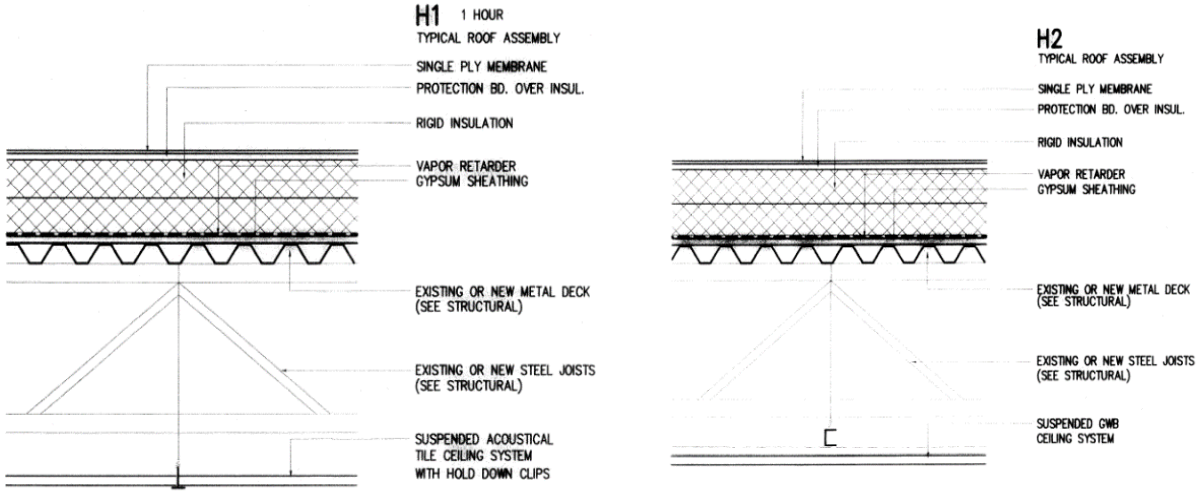
Detail from A3.1, 1999 Record Drawings

Project:
21156AN - ASD Tier 1
Baxter Elementary - Typical Building Weights

C - 04
Name: NIC
Date: 10/25/2021

3.0 Typical Roof Weight: 1999 Re-roof

Load Category	Item	Weight *(psf)*	Comment
Dead	Membrane	1.50	
Dead	Rigid insulation	1.50	6" (0.25 psf / in)
Dead	Metal Deck	2.50	1 1/2 x 20ga
Dead	Vapor Barrier	0.50	10 mil poly
Dead	Steel Joists & WF girders	3.50	
Dead	Misc. Mechanical & Eletrical	3.00	est.
Dead	Suspended Ceiling	1.80	Acoustical Tile + aluminum channel system
	Multiplier	1.00	
Dead	**Total**	**14.30**	**Summary**



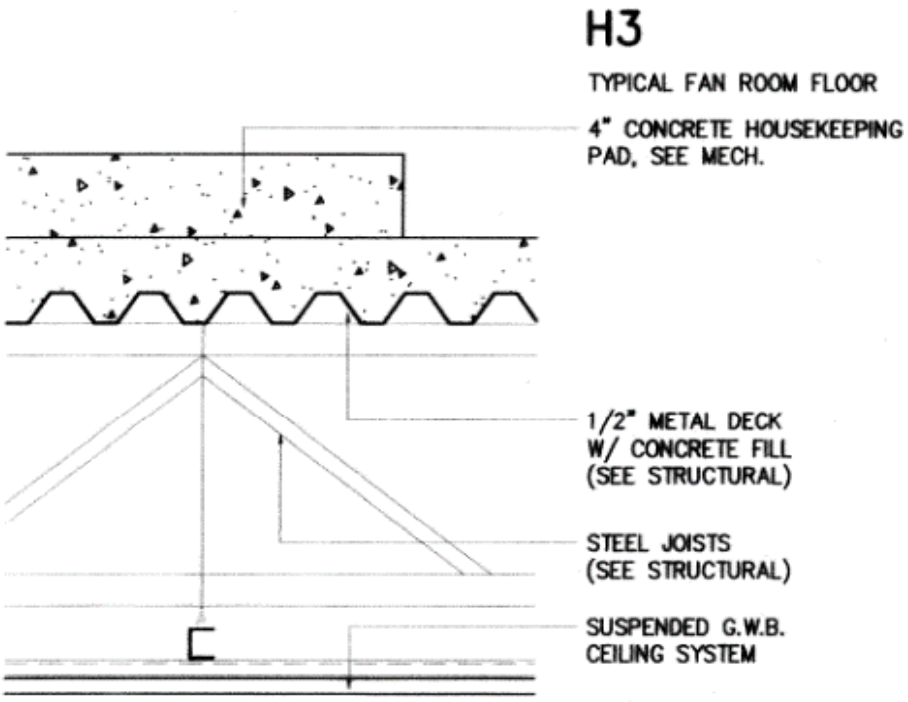
Details from A3.2, 1999 Record Drawings

Project:
21156AN - ASD Tier 1
Baxter Elementary - Typical Building Weights

C - 05
Name: NIC
Date: 10/25/2021

4.0 Typical Mechanical Floor Weight:

Load Category	Item	Weight (psf)	Comment
Dead	2 1/2" SOD	44.00	
Dead	Steel Joists	3.00	
Dead	Misc. Mechanical & Eletrical	4.00	est.
Dead	Suspended Ceiling	4.00	GWB ceiling system (est)
	Multiplier	1.00	
Dead	**Total**	**55.00**	**Summary**



Detail from A3.2, 1999 Record Drawings

Project:
21156AN - ASD Tier 1
Baxter Elementary - Typical Building Weights

C - 06
Name: NIC
Date: 10/25/2021

5.0 Typical Exterior 8" CMU Single Wythe

Load Category	Item	Weight *(psf)*	Comment
Dead	8" CMU	55.00	135 pcf block (grout 24" OC w/ face shell mortar)
Dead	Rigid insulation	0.50	2" (0.25 psf / in)
Dead	5/8 GWB	2.80	
Dead	Furring and Batt Insulation	2.00	Est
Dead	Misc. Mech & Elec.	2.00	
Dead	Multiplier	1.00	
Dead	**Total**	**62.30**	

6.0 Typical Exterior 12" CMU Single Wythe

Load Category	Item	Weight *(psf)*	Comment
Dead	12" CMU	90.00	135 pcf block (grout 16" OC w/ face shell mortar)
Dead	Rigid insulation	0.50	2" (0.25 psf / in)
Dead	5/8" GWB	2.80	
Dead	Furring and Batt Insulation	2.00	
Dead	Misc. Mech & Elec.	2.00	
Dead	Multiplier	1.00	
Dead	**Total**	**97.30**	

7.0 Typical Interior 8" CMU Single Wythe

Load Category	Item	Weight *(psf)*	Comment
Dead	8" CMU	55.00	135 pcf block (grout 24" OC w/ face shell mortar)
Dead	Metal Studs	1.50	Est
Dead	1/2" Sheathing	1.50	
Dead	Misc. Mech & Elec.	2.00	
Dead	Multiplier	1.00	
Dead	**Total**	**60.00**	

Project:
21156AN - ASD Tier 1
Baxter Elementary - Typical Building Weights

C - 07
Name: NIC
Date: 10/25/2021

8.0 Typical Interior 12" CMU Wall

Load Category	Item	Weight	Comment
		(psf)	
Dead	12" CMU	90.00	135 pcf block (grout 16" OC w/ face shell mortar)
Dead	Misc. Mech & Elec.	2	
Dead	Multiplier	1.00	
Dead	**Total**	**92.00**	

9.0 Typical Interior CFS Wall

Load Category	Item	Weight	Comment
		(psf)	
Dead	Metal Studs @ 16" OC	2.00	Est
Dead	(2) layers 5/8" GWB	5.00	
Dead	Misc. Mech & Elec.	2	
Dead	Multiplier	1.00	
Dead	**Total**	**9.00**	

10.0 Typical Exterior CFS Wall

Load Category	Item	Weight	Comment
		(psf)	
Dead	Metal Studs @ 16" OC	2.00	Est
Dead	5/8" GWB	2.50	
Dead	1/2" Sheathing	1.50	
Dead	R-19 Batt Insulation	0.60	
Dead	Misc. Mech & Elec.	2	
Dead	Multiplier	1.00	
Dead	**Total**	**8.60**	

Project:
21156AN - ASD Tier 1
Baxter Elementary - Typical Building Weights

C - 08
Name: NIC
Date: 10/25/2021

11.0 Typical Interior 6" CMU Single Wythe

Load Category	Item	Weight	Comment
		(psf)	
Dead	6" CMU	64.00	135 pcf block (Fully grouted w/ face shell mortar)
Dead	Metal Studs	1.50	Est
Dead	1/2" Sheathing	1.50	
Dead	Misc. Mech & Elec.	2.00	
Dead	Multiplier	1.00	
Dead	**Total**	**69.00**	

Project:
21156AN - ASD Tier 1
Baxter Elementary - Seismic Weights

C - 09
Name: NIC
Date: 10/25/2021

1.0 - Floor & Roof Dead Weights

Floor	Sub Area	Trib. Area		Typ. Weight	Weight	Comments
(#)	(#)	(sf)		(psf)	(kip)	
(1) South Penthouse	*(2) 6" Slab*	875		75.0	66	
	(4) SOD	828		55.0	46	
	(3) Typ Deck	322		14.3	5	
	Total	**2025**			**116**	
(2) Low Roof	*(3) Typ Deck*	42332		14.3	605	
	(4) SOD	3938		55.0	217	
	(1) 7" Slab	483		87.5	42	
	Total	**46753**			**864**	
(3) Entrance	***Total***	**2077**		14.3	**30**	
(4) High Roof	***Total***	**9390**		14.3	**134**	
(5) New Central Penthouse	***Total***	**4459**		14.3	**64**	
(6) Old Central Penthouse	***Total***	***507***		14.3	**7**	
Σ **Floors**	*>>>*				***1215***	*Dead weight of all floors & Roofs*

2.0 - Roof Snow Weight

Floor	Sub Area	Trib. Area		Typ. Weight	Weight	Comments
(#)	(#)	(sf)		(psf)	(kip)	
(1) South Penthouse		*0*		*40*	*0*	*Snow load - Current*
(2) Low Roof		*41810*		*40*	*1672*	*Snow load - Current*
(3) Entrance		*2077*		*40*	*83*	*Snow load - Current*
(4) High Roof		*9390*		*40*	*376*	*Snow load - Current*
(5) New Central Penthouse		*4459*		*40*	*178*	*Snow load - Current*
(6) Old Central Penthouse		*507*		*40*	*20*	*Snow load - Current*

Project:
21156AN - ASD Tier 1
Baxter Elementary - Seismic Weights

C - 10
Name: NIC
Date: 10/25/2021

3.0 - Wall Dead Weights - Tributary to Floor

Floor		Trib. Height	Length	Typ. Weight	Weight	Comments
(#)		(ft)	(#)	(psf)	(kip)	
(1) South Penthouse	***Total***				***113***	***Total weight of walls trib to roof***
		6.5	*130*	*62.3*	*52*	*Exterior 8" CMU*
		6.5	*140*	*60.0*	*55*	*Interior 8" CMU*
		6.5	*89*	*9.0*	*5*	*Interior CFS*
		6.5	*12*	*8.6*	*1*	*Exterior CFS*
(2) Low Roof	***Total***				***1066***	***Total weight of walls trib to roof***
		6.5	*78*	*69.0*	*35*	*Interior 6" CMU*
		6.5	*1039*	*62.3*	*421*	*Exterior 8" CMU*
		6.5	*1190*	*60.0*	*464*	*Interior 8" CMU*
		6.5	*2106*	*9.0*	*123*	*Interior CFS*
		6.5	*25*	*8.6*	*1*	*Exterior CFS*
		5.5	*115.5*	*9.0*	*6*	*Interior CFS - From New Penthouse*
		5.5	*302.0*	*8.6*	*14*	*Exterior CFS - From New Penthouse*
		5.5	*98.0*	*69.0*	*37*	*6" CMU - From Old Penthouse*
(3) Entrance	***Total***				***92***	***Total weight of walls trib to roof***
		8.0	*125*	*62.3*	*62*	*Exterior 8" CMU*
		8.0	*54*	*60.0*	*26*	*Interior 8" CMU*
		8.0	*52*	*9.0*	*4*	*Interior CFS*
(4) High Roof	***Total***				***416***	***Total weight of walls trib to roof***
		10.5	*229*	*60.0*	*144*	*Interior 8" CMU*
		10.5	*140*	*62.3*	*92*	*Exterior 8" CMU*
		10.5	*97*	*92.0*	*94*	*Interior 12" CMU*
		10.5	*81*	*97.3*	*82*	*Exterior 12" CMU*
		10.5	*44*	*9.0*	*4*	*Interior CFS*
(5) New Penthouse	***Total***				***20***	***Total weight of walls trib to roof***
		5.5	*116*	*9.0*	*6*	*Interior CFS*
		5.5	*302*	*8.6*	*14*	*Exterior CFS*
(6) Old Penthouse	***Total***				***37***	***Total weight of walls trib to roof***
		5.5	*98*	*69.0*	*37*	*Interior 6" CMU*

Project:
21156AN - ASD Tier 1
Baxter Elementary - Seismic Weights

C - 11
Name: NIC
Date: 10/25/2021

4.0 - Seismic Weights Tributary To Story

	Wall	Floor	20% Snow		Seismic	
Floor	**Weight**	**Weight**	**Weight**		**Weight**	**Comments**
(#)	**(kip)**	**(kip)**	**(kip)**		**(kip)**	
0						*Ground floor*
1	*113*	*116*	*0*		*229*	*South Penthouse*
2	*1066*	*864*	*334*		*2265*	*Low Roof*
3	*92*	*30*	*17*		*138*	*Entrance*
4	*416*	*134*	*75*		*626*	*High Roof*
5	*20*	*64*	*36*		*119*	*New Central Penthouse*
6	*37*	*7*	*4*		*48*	*Old Central Penthouse*
Σ **Floors**	>>				*3426*	*Total seismic weight (excluding Ground)*

4.1 - Assumed Seismic Weights Tributary To Story

	Wall	Floor	20% Snow		Seismic	
Floor	**Weight**	**Weight**	**Weight**		**Weight**	**Comments**
(#)	**(kip)**	**(kip)**	**(kip)**		**(kip)**	
0						*Ground floor*
1	*1271*	*1010*	*351*		*2632*	*Mech floors + low roof*
2	*529*	*250*	*75*		*674*	*High roof + South Penthouse*
3	*57*	*71*	*40*		*119*	*New Central Penthouse Roof*
Σ **Floors**	>>				*3426*	*Total seismic weight (excluding Ground)*

9/27/21, 3:02 PM

ATC Hazards by Location

Hazards by Location

Search Information

Address:	baxter elementary anchorage alaska
Coordinates:	61.1932146, -149.7617573
Elevation:	234 ft
Timestamp:	2021-09-27T23:02:13.500Z
Hazard Type:	Seismic
Reference Document:	ASCE41-17
Site Class:	D-default
Custom Probability:	

Horizontal Response Spectrum - Hazard Lev

Hazard Level BSE-2N

Name	Value	Description
SsUH	1.706	Factored uniform-hazard spectral acceleration (2% probability of exceedance in 50 years)
CR_S	1.11	Coefficient of risk (0.2s)
SsRT	1.894	Probabilistic risk-targeted ground motion (0.2s)
SsD	1.5	Factored deterministic acceleration value (0.2s)
S_S	1.5	MCE_R ground motion (period=0.2s)
F_a	1.2	Site amplification factor at 0.2s
S_{XS}	1.8	Site modified spectral response (0.2s)
S1UH	0.81	Factored uniform-hazard spectral acceleration (2% probability of exceedance in 50 years)
CR_1	1.037	Coefficient of risk (1.0s)
S1RT	0.84	Probabilistic risk-targeted ground motion (1.0s)
S1D	0.682	Factored deterministic acceleration value (1.0s)
S_1	0.682	MCE_R ground motion (period=1.0s)
F_v	1.7	Site amplification factor at 1.0s
S_{X1}	1.159	Site modified spectral response (1.0s)

Hazard Level BSE-1N

Name	Value	Description
S_{XS}	1.2	Site modified spectral response (0.2s)
S_{X1}	0.772	Site modified spectral response (1.0s)

Hazard Level BSE-2E

Name	Value	Description
S_S	1.304	MCE_R ground motion (period=0.2s)
F_a	1.2	Site amplification factor at 0.2s
S_{XS}	1.565	Site modified spectral response (0.2s)
S_1	0.598	MCE_R ground motion (period=1.0s)
F_v	1.702	Site amplification factor at 1.0s
S_{X1}	1.018	Site modified spectral response (1.0s)

Hazard Level BSE-1E

Name	Value	Description
S_S	0.786	MCE_R ground motion (period=0.2s)
F_a	1.2	Site amplification factor at 0.2s
S_{XS}	0.943	Site modified spectral response (0.2s)
S_1	0.332	MCE_R ground motion (period=1.0s)
F_v	1.968	Site amplification factor at 1.0s
S_{X1}	0.653	Site modified spectral response (1.0s)

T_L Data

Name	Value	Description
T_L	16	Long-period transition period (s)

The results indicated here DO NOT reflect any state or local amendments to the values or any delineation lines made during the building code adoption process. Users should confirm any output obtained from this tool with the local Authority Having Jurisdiction before proceeding with design.

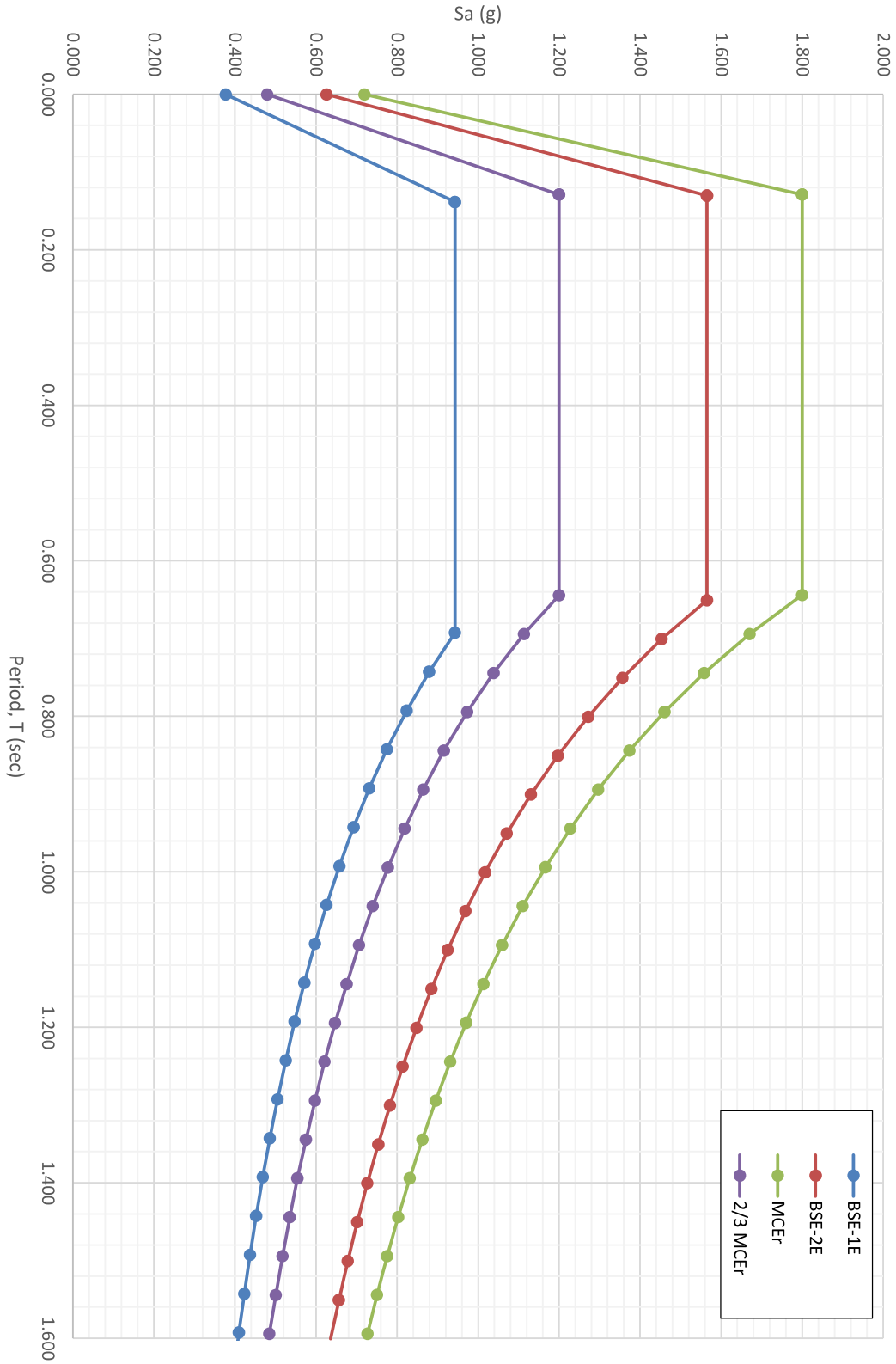
Disclaimer

Hazard loads are provided by the U.S. Geological Survey Seismic Design Web Services.

While the information presented on this website is believed to be correct, ATC and its sponsors and contributors assume no responsibility or liability for its accuracy. The material presented in the report should not be used or relied upon for any specific application without competent examination and verification of its accuracy, suitability and applicability by engineers or other licensed professionals. ATC does not intend that the use of this information replace the sound judgment of such competent professionals, having experience and knowledge in the field of practice, nor to substitute for the standard of care required of such professionals in interpreting and applying the results of the report provided by this website. Users of the information from this website assume all liability arising from such use. Use of the output of this website does not imply approval by the governing building code bodies responsible for building code approval and interpretation for the building site described by latitude/longitude location in the report.

Project:
21156AN - ASD Tier 1
Seismic Response Spectra - Site Class D (default)

C - 14
Name: NIC
Date: 10/25/2021



Project:
21156AN - ASD Tier 1
Baxter Elementary - Quick-Checks

C - 15
Name: NIC
Date: 10/25/2021

1 - Seismic Base Shear: ASCE 41-17 Tier I Procedure

Notes: *1. Seismic Forces calculated following the Tier - III procedure of ASCE 41-17. Analysis Method used is the LSP*

Seismic Response Spectra Inputs			
BSE-1E	S_{x1}	0.653	(g)
	S_{xs}	0.786	(g)
	S_a	0.786	(g)
BSE-2E	S_{x1}	1.018	(g)
	S_{xs}	1.565	(g)
	S_a	1.565	(g)
Period	T	0.22	(sec)

Seismic Base Shears			
Weight	W	3426	(kip)
BSE - 1E	V_{1E}	2693	(kip)
BSE - 2E	V_{2E}	5361	(kip)

Comments:

$S_a = \frac{S_{X1}}{T} < S_{XS}$ $Eq. 4-3$

$T = C_t H_n^{\beta}$ Eq. 4–4

$V = CS_aW$ Eq. 4-1

$C_{vx} = \frac{w_x h_x^k}{\sum w_i h_i^k}$ Eq. 4-2a

$F_i = C_{vx} V$ Eq. 4-2a

Seismic Base Shear - Tier 1 Method		
C	1	ASCE 41-17 4-7
k	1.00	ASCE 41-17 Section 7.4.1.3.2

Approx. Structural Period (Method-2 Emperical)		
C_t	0.02	ASCE 41-17 Section 4.4.2.3
β	0.75	ASCE 41-17 Section 4.4.2.3
h_n	24	(ft) - Structural Height

2 - Pseudo Seismic Forces Story Forces

				Seismic Weights Tributary:			
			Story Height	Tot. Story	Diaphragm		
	Floor	Elevation	h_{ix}	W_x	N-S W_{px}	E-W W_{px}	$w_x h_x^k$
		(ft)	*(ft)*	(kip)	(kip)	(kip)	
Ground	0	0	0				
Low roof	1	13.00	13.00	2632			34213
High roof	2	21.00	8.00	674			14161
Penthouse Roof	3	24.00	3.00	119			2867
		Totals ->>	**24.0**	**3,426**			**51,241**

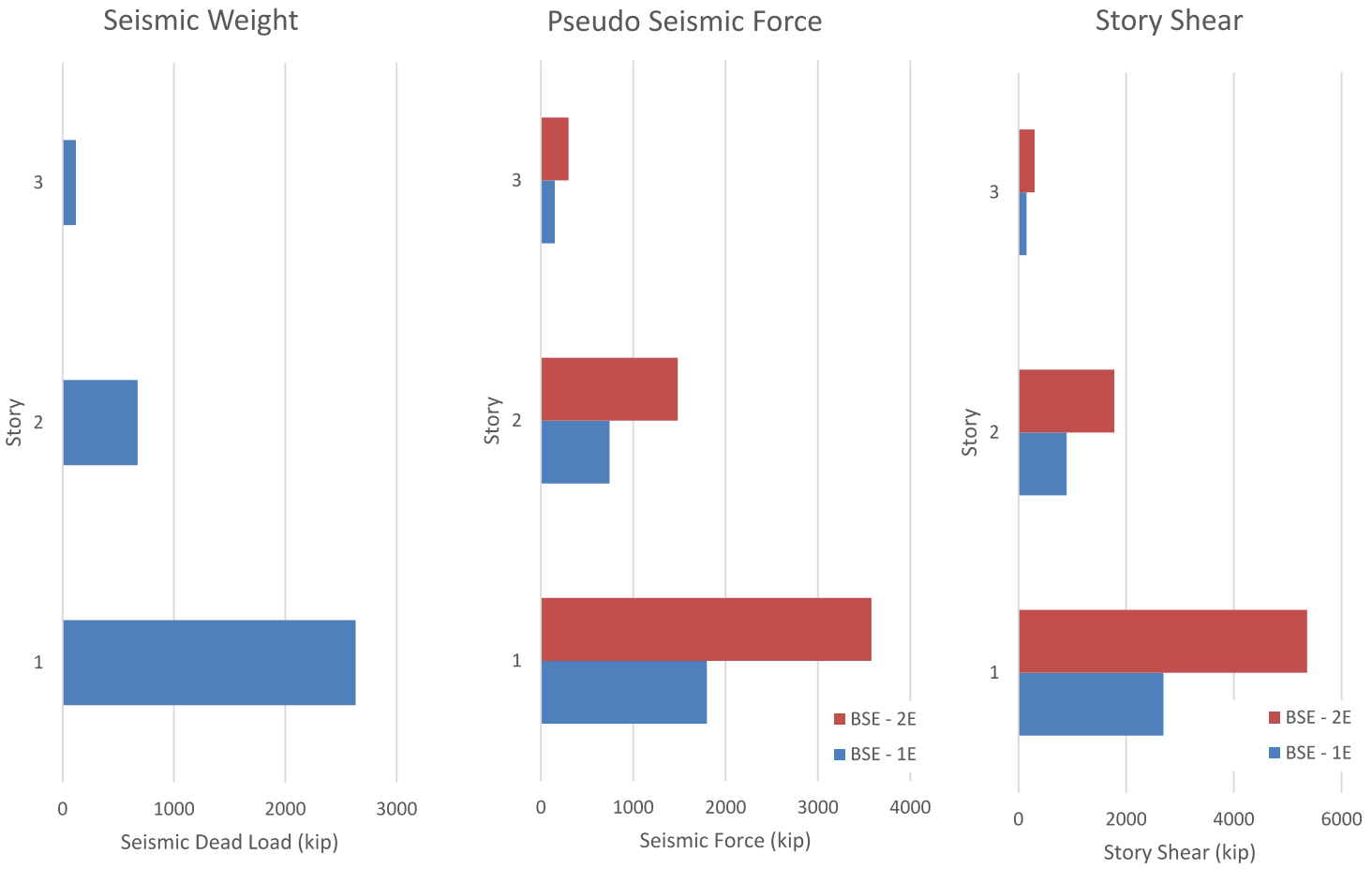
BSE - 1E	
Story Force	Story Shear
F_x	V_x
(kip)	(kip)
-	-
1798	2693
744	895
151	151
2,693	**2,693**

BSE -2E	
Story Force	Story Shear
F_x	V_x
(kip)	(kip)
-	-
3580	5361
1482	1782
300	300
5,361	**5,361**

Project:
21156AN - ASD Tier 1
Baxter Elementary - Quick-Checks

C - 16
Name: NIC
Date: 10/25/2021

3 - Pseudo Seismic Forces Story Forces & Story Shear Plots:



C - 17

PDC ENGINEERS
PLAN • DESIGN • CONSTRUCT

Design Sheet

PROJECT: 21156AN ASD T1

Date: 10/25/2021
By: NIC

Base Shear Comparision (1 of 2)

- **Notes:**
  1. IBC 2018 / ASCE 7-16 vs. 1970 UBC
  2. For derivation of building seismic weight see seismic load calculations.

- **Building Properties:**

$W_b := 3426 \cdot kip$ — Building seismic weight, total

$h_n := 21 \cdot ft$ — Height of high roofs, excluding mech pent.

- **Base Shear: 1970 UBC**

$Z := 1$ — Zone 3 - Record drawings

$K := 1.33$ — Table 23-H, UBC

$T_s := \frac{0.05 h_n}{ft\sqrt{290}} = 0.06$ sec — Eq 14-3 UBC

$C := 0.10 = 0.1$ — Eq. 14-2 UBC, exception for 1 & 2 story bldgs.

$V_{s1} := Z \cdot K \cdot C \cdot W_b = 455.66 \cdot kip$ — Base shear, Eq. 14-1 UBC

$s_{a\_UBC} := Z = 1$ — Effective seismic acceleration

$R_{eq} := \frac{5.1}{K} = 3.83$ — Equivalent force reduction factor, "Ductile Design of Steel Structures", Burneau, Equation 7.53

C - 18

PDC ENGINEERS
PLAN • DESIGN • CONSTRUCT

Design Sheet

PROJECT: 21156AN ASD T1

Date: 10/25/2021
By: NIC

Base Shear Comparision (1 of 2)

- **Base Shear: 2018 IBC & ASCE 7-16**

$c_t := 0.02$ — ASCE 7-16 Table 12.8-2 fundamental period coefficient

$x := 0.75$ — ASCE 7-16 Table 12.8-2 fundamental period coefficient

$T_a := (sec) \cdot c_t \cdot \left(\frac{h_n}{ft}\right)^x = 0.2\,s$ — ASCE 7-16 Eq. 12.8-7 Approximate fundamental period

$I_e := 1.25$ — ASCE 7-16 Table 1.5-2 Importance factor, type II building

$S_{ds} := 1.2$

$S_{d1} := 0.773$ — Design spectral response acceleration, site class - D default

$R' := 2$ — Response modification coefficient, ASCE 7-16 Table 12.2.1 Ordinary Reinforced Shear Masonry Walls

$C_s := \frac{S_{ds}}{\left(\frac{R'}{I_e}\right)} = 0.75$ — ASCE 7-16 Eq. 12.8-2, Seismic response coefficient

$V_{s2} := 0.7 C_s \cdot (W_b) = 1798.65 \cdot kip$ — Seismic Base Shear, ASCE 7-16 Eq. 12.8-1

- **ASD - Seismic Base Shear Comparision**

$\frac{V_{s2}}{V_{s1}} = 394.74 \cdot \%$ — Increase in equivalent lateral force between original building code & 2018 IBC

$\frac{S_{ds}}{s_{a\_UBC}} = 120 \cdot \%$ — Increase in seismic acceleration between original building code & 2018 IBC

$\frac{R'}{R_{eq}} = 52.16 \cdot \%$ — Decrease in percieved ductility between original building code & 2018 IBC

2.0 – QUICK-CHECKS:

C - 20

PDC ENGINEERS
PLAN • DESIGN • CONSTRUCT

Design Sheet

PROJECT: 21156AN - ASD Tier 1
(1 of 4)

Date: 10/27/2021
By: NIC

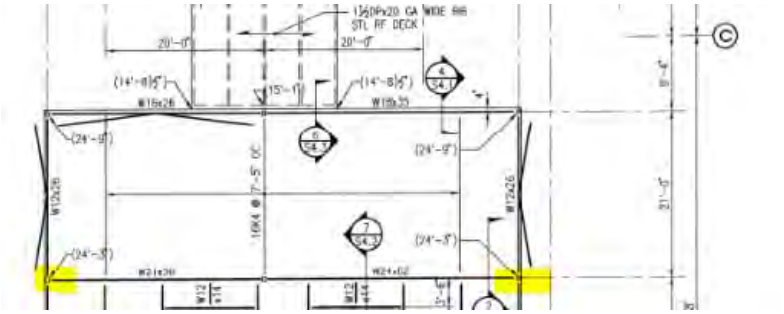
ASCE 41-17 Quick-Checks: Column Axial Stress

- **Notes:**
  1. *Reference ASCE 41-17 4.4.3.4*
  2. *Record drawings, 1999*

- **Column Axial Stress - Column: TS4x4x3/16**

Gravity forces

Columns at penthouse perimeter, between Grids C&D:



$F_y := 46ksi$ — *Record Drawings, 1999 S0.1*

$A_{col} := 2.58in^2$ — Area of the end column of the frame

$p_{D\_f} := 14.3psf$ — Dead pressure of roof

$p_S := 40psf$ — Snow load pressure

$A_f := \frac{32ft}{2} \cdot \frac{21ft + 35.33ft}{2}$ — Tributary area of roof at worst case column (east end of penthouse)

$A_f = 450.64\,ft^2$

$\sigma_g := \frac{1.1\left(p_{D\_f} + p_S\right) \cdot A_f}{A_{col}} = 10.43 \cdot ksi$ — *ASCE 41-17 Section 7.2.2*

$DCR_1 := \frac{\sigma_g}{0.1 \cdot \left(F_y\right)} = 226.8 \cdot \%$

C - 21

PDC ENGINEERS
PLAN • DESIGN • CONSTRUCT

Design Sheet

PROJECT: 21156AN - ASD Tier 1
(2 of 4)

Date: 10/27/2021
By: NIC

Overturning forces

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

System modification factor

$$n_f := 2$$

Number of frames in ea direction, min

$$h_n := 11.75\text{ft}$$

Height above the base to the roof level

$$L := 17.33\text{ft}$$

Total length of the frame (minimum, worst case)

$$V := 300\text{kip}$$

Story shear at BSE-2E

$$p_{ot} := \frac{1}{M_s} \cdot \left(\frac{2}{3}\right) \cdot \left(\frac{V \cdot h_n}{L \cdot n_f}\right) \cdot \left(\frac{1}{A_{col}}\right)$$

$$p_{ot} = 13.14 \cdot \text{ksi}$$

Axial stress of columns subjected to overurning forces

$$DCR_2 := \frac{p_{ot}}{0.3 \cdot \left(F_y\right)} = 95.22 \cdot \%$$

C - 22

PDC ENGINEERS
PLAN • DESIGN • CONSTRUCT

Design Sheet

PROJECT: 21156AN - ASD Tier 1
(3 of 4)

Date: 10/27/2021
By: NIC

Gravity forces

- **Column Axial Stress - Column: TS3x3x3/16**

$A_{col} := 1.89in^2$

Area of the end column of the frame

$A_f := \frac{32ft}{2} \cdot \frac{21ft}{2}$

$A_f = 168\,ft^2$

Tributary area of roof at worst case column (east end of penthouse)

$\sigma_g := \frac{1.1\left(p_{D\_f} + p_S\right) \cdot A_f}{A_{col}} = 5.31 \cdot ksi$

ASCE 41-17 Section 7.2.2

$DCR_1 := \frac{\sigma_g}{0.1 \cdot \left(F_y\right)} = 115.42 \cdot \%$

C - 23

PDC ENGINEERS
PLAN • DESIGN • CONSTRUCT

Design Sheet

PROJECT: 21156AN - ASD Tier 1
(4 of 4)

Date: 10/27/2021
By: NIC

Overturning forces - Typical Column:

$A_{col} := 1.89in^2$ — Area of the end column of the frame

$M_s := \frac{2.5 + 1.5}{2} = 2$ — System modification factor

$n_f := 2$ — Number of frames in ea direction, min

$h_n := 11.75ft$ — Height above the base to the roof level

$L := 17.33ft$ — Total length of the frame (minimum, worst case)

$V := 300kip$ — Story shear at BSE-2E

$$p_{ot} := \frac{1}{M_s} \cdot \left(\frac{2}{3}\right) \cdot \left(\frac{V \cdot h_n}{L \cdot n_f}\right) \cdot \left(\frac{1}{A_{col}}\right)$$

$p_{ot} = 17.94 \cdot ksi$ — Axial stress of columns subjected to overurning forces

$$DCR_2 := \frac{p_{ot}}{0.3 \cdot (F_y)} = 129.98 \cdot \%$$

C - 24

PDC ENGINEERS
PLAN • DESIGN • CONSTRUCT

Design Sheet

PROJECT: 21156AN - ASD Tier 1
(1 of 2)

Date: 10/25/2021
By: NIC

ASCE 41-17 Quick-Checks: Brace Axial Stress

- **Notes:**
  1. *Reference ASCE 41-17 4.4.3.4*
  2. *Record drawings, 1999*

- **Brace Axial Stress - Braces: TS5x5x3/16,TS4x4x3/16,TS3x3x3/16**

$$\lambda_{avg} := \frac{25.7 + 20 + 14.2}{3}$$ Average d/t

$$F_y := 46ksi$$ *Record Drawings, 1999 S0.1*

$$F_{ye} := 1.25 \cdot F_y = 57.5 \cdot ksi$$ Expected yield strength, per ASCE 41-17 Table 4-9 Footnotes

$$a := \frac{1}{\sqrt{F_{ye} \cdot \frac{1}{ksi}}} = 0.13$$ Denominator of depth-to-thickness limits for tubes *ASCE Table 4-9*

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

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

$$M_s := \begin{cases} M_{s\_low} & \text{if } \lambda_{avg} < 90 \cdot a \\ M_{s\_high} & \text{if } \lambda_{avg} > 190 \cdot a \\ \left[M_{s\_low} + \left(\lambda_{avg} - 90a \right) \cdot \frac{\left(M_{s\_high} - M_{s\_low} \right)}{(190a - 100a)} \right] & \text{otherwise} \end{cases}$$

$$M_s = 3.87$$ Modification factor, damage control limit state @ BSE-2E

$$s_{avg} := \frac{2 \cdot 21ft + 27.3ft + 17.3ft}{4}$$

$$s_{avg} = 21.65\,ft$$ Average span, all braced frames

$$L_{br} := \frac{4\sqrt{\left(\frac{21ft}{2}\right)^2 + (11.75ft)^2} + 2 \cdot \sqrt{\left(\frac{27.3ft}{2}\right)^2 + (11.75ft)^2} + 2 \cdot \sqrt{\left(\frac{17.3ft}{2}\right)^2 + (11.75ft)^2}}{8}$$

$$L_{br} = 16.03\,ft$$ Average length of all braces

C - 25

PDC ENGINEERS
PLAN • DESIGN • CONSTRUCT

Design Sheet

PROJECT: 21156AN - ASD Tier 1
(2 of 2)

Date: 10/25/2021
By: NIC

$A_{br} := (3.28 + 2.58 + 1.89)\cdot in^2$ Average x-sectional area of braces

$V_{2E} := 300kip$ Story shear at BSE-2E

$n_{br} := 2$ Number of braced frames in ea direction, min

$$f_1 := \frac{1}{M_s}\cdot\left(\frac{V_{2E}}{s_{avg}\cdot n_{br}}\right)\cdot\left(\frac{L_{br}}{A_{br}}\right) = 3.7\cdot ksi$$ Brace axial stress - Eq. 4-9

$$DCR_1 := \frac{f_1}{0.5\cdot\left(F_y\right)} = 16.08\cdot\%$$

C - 26

PDC ENGINEERS
PLAN • DESIGN • CONSTRUCT

Design Sheet

PROJECT: 21156AN - ASD Tier 1
(1 of 11)

Date: 10/27/2021
By: NIC

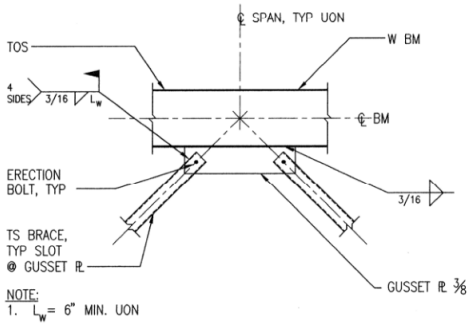
ASCE 41-17 Quick-Checks: Brace Connection Strength

- **Notes:**
  1. *Reference ASCE 41-17 A3.3.1.5*
  2. *Record drawings, 1999*

- **Brace Connection Strength:** Details 1, 2 & 3 / S4.3

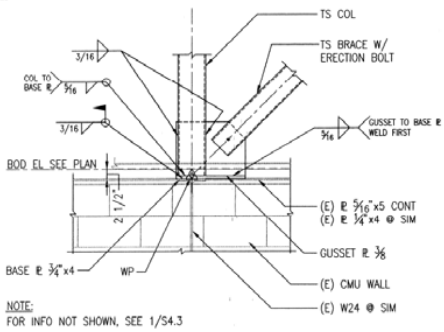
$D_w := 3$ Weld size in 1/16"

$\varphi R_n := 4 \cdot 1.392 \cdot \frac{kip}{in} \cdot D_w \cdot 6 \cdot in = 100.22 \cdot kip$ Brace to gusset weld strength



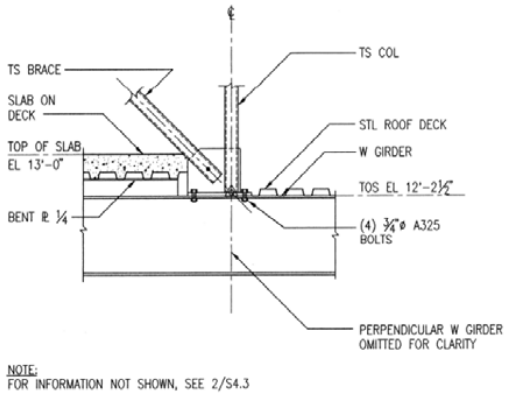
① TS BRACE AT W GIRDER
SCALE: 3/4"=1'-0"

From 1999 Record Drawings, 1/S4.3



② TS BRACE TO TS COL AT (E) CMU
SCALE: NTS

From 1999 Record Drawings, 2/S4.3



③ TS BRACE TO TS COL AND W GIRDER
SCALE: NTS

From 1999 Record Drawings, 3/S4.3

C - 27

PDC ENGINEERS
PLAN • DESIGN • CONSTRUCT

Design Sheet

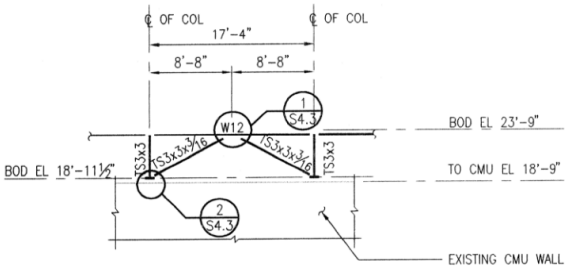
PROJECT: 21156AN - ASD Tier 1
(2 of 11)

Date: 10/27/2021
By: NIC

- **Brace Buckling Strength:** *Grid D (South fan room brace)*
  TS3x3x3/16 A500 Gr. B

$$L_u := \sqrt{(8.66\text{ft})^2 + (5\text{ft})^2} = 10\,\text{ft}$$

$$P_{n_1} := 41.3\text{kip}$$



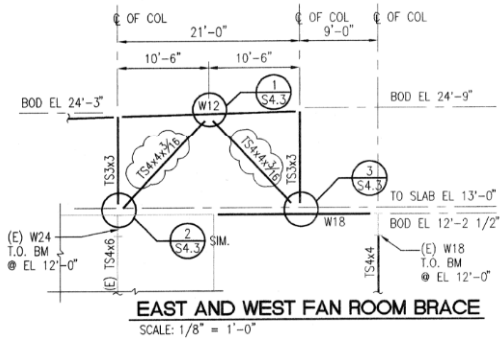
SOUTH FAN ROOM BRACE
SCALE: 1/8" = 1'-0"

From 1999 Record Drawings, S2.5

- **Brace Buckling Strength:** *East & West fan room braces*
  TS4x4x3/16 A500 Gr. B

$$L_u := \sqrt{(10.5\text{ft})^2 + (11.75\text{ft})^2} = 15.76\,\text{ft}$$

$$P_{n_2} := 43.6\text{kip}$$



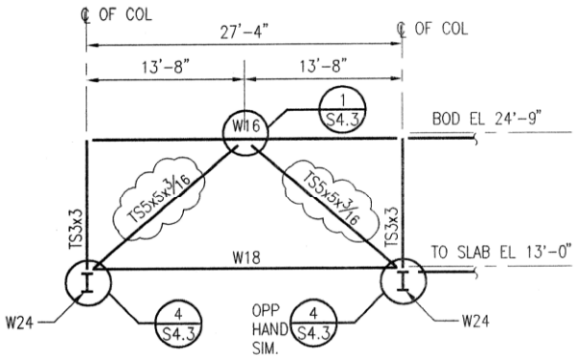
EAST AND WEST FAN ROOM BRACE
SCALE: 1/8" = 1'-0"

From 1999 Record Drawings, S2.5

- **Brace Buckling Strength:** *North fan room braces*
  TS5x5x3/16 A500 Gr. B

$$L_u := \sqrt{(13.66\text{ft})^2 + (11.75\text{ft})^2} = 18.02\,\text{ft}$$

$$P_{n_3} := 66.7\text{kip}$$



NORTH FAN ROOM BRACE
SCALE: 1/8" = 1'-0"

From 1999 Record Drawings, S2.5

$$DCR_1 := \frac{\max(P_n)}{\varphi R_n} = 66.55\cdot\%$$

C - 28

PDC ENGINEERS
PLAN • DESIGN • CONSTRUCT

Design Sheet

PROJECT: 21156AN - ASD Tier 1
(3 of 11)

Date: 10/27/2021
By: NIC

- **Brace Yield Strength:** *Grid D (South fan room brace)*

TS3x3x3/16 A500 Gr. B

$A := 1.89in^2$

$F_y := 46ksi$

$T_{n_1} := A \cdot F_y = 86.94 \cdot kip$

TS4x4x3/16 A500 Gr. B

$A := 2.58in^2$

$T_{n_2} := A \cdot F_y = 118.68 \cdot kip$

TS5x5x3/16 A500 Gr. B

$A := 3.28in^2$

$T_{n_3} := A \cdot F_y = 150.88 \cdot kip$

$\varphi R_n = 100.22 \cdot kip$

$$DCR_2 := \frac{\max(T_n)}{\varphi R_n} = 150.54 \cdot \%$$

Checklist Statement = Non-Conforming

C - 29

PDC ENGINEERS
PLAN • DESIGN • CONSTRUCT

Design Sheet

PROJECT: 21156AN - ASD Tier 1
(4 of 11)

Date: 10/27/2021
By: NIC

ASCE 41-17 Quick-Checks: Brace Compactness

- **Notes:**
  1. *Reference ASCE 41-17*
  2. *Record drawings, 1999*

- **Brace Compactness:** *AISC 341-16 Table D1.1*

$$\lambda_{lim} := 0.76 \cdot \sqrt{\frac{29000ksi}{F_y}} = 19.08$$

$\lambda_1 := 14.2$ *HSS3x3x3/16 A500 Gr. B*

$\lambda_2 := 20$ *HSS4x4x3/16 A500 Gr. B*

$\lambda_3 := 25.7$ *HSS5x5x3/16 A500 Gr. B*

$$DCR_3 := \frac{\max(\lambda)}{\lambda_{lim}} = 134.68 \cdot \%$$

Checklist Statement = Non-conforming

C - 30

PDC ENGINEERS
PLAN • DESIGN • CONSTRUCT

Design Sheet

PROJECT: 21156AN - ASD Tier 1
(5 of 11)

Date: 10/27/2021
By: NIC

ASCE 41-17 Quick-Checks: Brace Slenderness

- **Notes:**
  1. *Reference ASCE 41-17*
  2. *Record drawings, 1999*

- **Brace Slenderness:** *Grid C (North Fan room brace)*

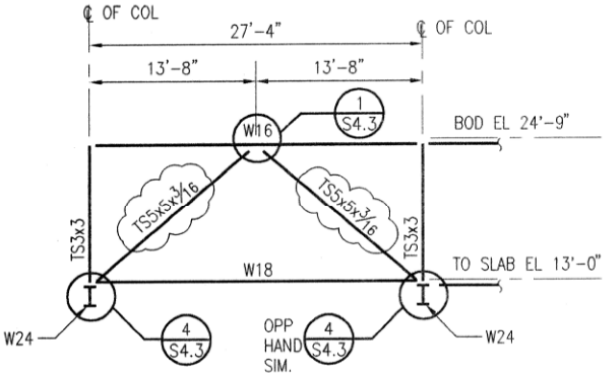
Brace with lowest radius of gyration is TS3x3x3/16. Assume this brace at largest frame (conservative), enveloping all braced frames.

$$L_u := \sqrt{(13.66\,\text{ft})^2 + (11.75\,\text{ft})^2} = 18.02\,\text{ft}$$

$k := 1$ Effective length factor

$$r_y := 1.14 \cdot \text{in}$$

$$\lambda := \frac{L_u \cdot k}{r_y} = 189.67$$



NORTH FAN ROOM BRACE
SCALE: 1/8" = 1'-0"

From 1999 Record Drawings, S2.5

$$DCR := \frac{\lambda}{200} = 94.83 \cdot \%$$

Checklist Statement = Conforming

C - 31

PDC ENGINEERS
PLAN • DESIGN • CONSTRUCT

Design Sheet

PROJECT: 21156AN - ASD Tier 1
(6 of 11)

Date: 10/27/2021
By: NIC

ASCE 41-17 Quick-Checks: Chevron Beam Capacity

- **Notes:**
  1. *Reference ASCE 41-17*
  2. *Record drawings, 1999*

North Fan Room

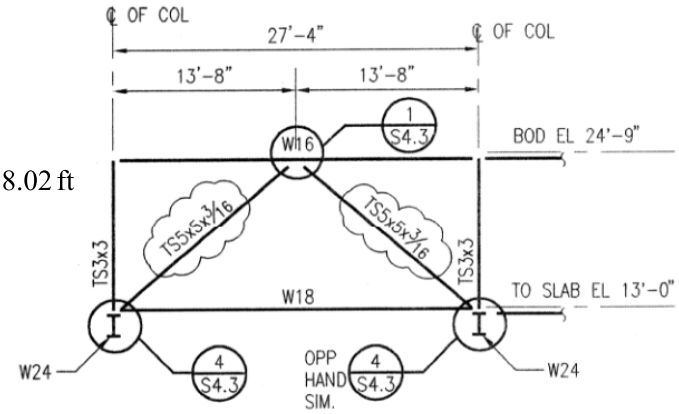
Brace = TS 5x5x3/16

Brace length:

$$L_{br} := \sqrt{(13.66\text{ft})^2 + (11.75\text{ft})^2} = 18.02\,\text{ft}$$

Brace angle:

$$\theta_{br} := \operatorname{atan}\left(\frac{11.75\text{ft}}{13.66\text{ft}}\right) = 40.7\cdot\text{deg}$$



From 1999 Record Drawings, S2.5

Brace factored yield strength:

$$T_{n_3} = 150.88\cdot\text{kip}$$

Brace factored compression strength:

$$P_{n_3} = 66.7\cdot\text{kip}$$

Net vertical force on beam:

$$F_v := \left(T_{n_3} - P_{n_3}\right)\cdot\sin\left(\theta_{br}\right)$$

$$F_v = 54.9\cdot\text{kip}$$

Total horizontal force on beam:

$$F_h := \left(T_{n_3} + P_{n_3}\right)\cdot\cos\left(\theta_{br}\right)$$

$$F_h = 164.95\,\text{kip}$$

Beam = W16x26 $\quad F_{y\_bm} := 36\text{ksi}$

Beam Length:

$$L_{bm} := 27.33\text{ft}$$

C - 32

PDC ENGINEERS
PLAN • DESIGN • CONSTRUCT

Design Sheet

PROJECT: 21156AN - ASD Tier 1
(7 of 11)

Date: 10/27/2021
By: NIC

Moment in beam from net vertical force:

$$M_{br} := \frac{F_v \cdot L_{bm}}{4} = 375.07 \cdot kip \cdot ft$$

$$\phi M_n := 79.4 kip \cdot ft$$

Beam moment capacity calculated with RISA3D with top flange fully braced.

$$\phi P_n := 97 kip$$

Beam compression capacity calculated with RISA3D with KL = 13'-8"

$$\frac{F_h}{\phi P_n} = 1.7$$

$$DCR_1 := \frac{F_h}{\phi P_n} + \frac{8}{9} \cdot \frac{M_{br}}{\phi M_n} = 589.95 \cdot \%$$

AISC 360-16 (H1-1a)

C - 33

PDC ENGINEERS
PLAN • DESIGN • CONSTRUCT

Design Sheet

PROJECT: 21156AN - ASD Tier 1
(8 of 11)

Date: 10/27/2021
By: NIC

East and West Fan Room

Brace = TS 4x4x3/16

Brace length:

$$L_{br} := \sqrt{(10.5\text{ft})^2 + (11.75\text{ft})^2} = 15.76\,\text{ft}$$

Brace angle:

$$\theta_{br} := \text{atan}\left(\frac{11.75\text{ft}}{10.5\text{ft}}\right) = 48.22\cdot\text{deg}$$

Brace factored yield strength:

$$T_{n_2} := 106.8\text{kip}$$

Brace factored compression strength:

$$P_{n_2} := 39.2\text{kip}$$

Net vertical force on beam:

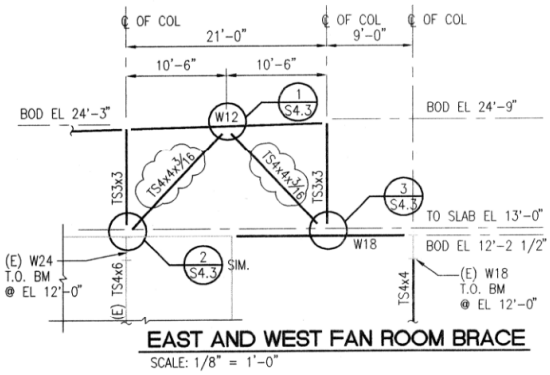
$$F_v := \left(T_{n_2} - P_{n_2}\right)\cdot\sin\left(\theta_{br}\right)$$

$$F_v = 50.41\cdot\text{kip}$$

Total horizontal force on beam:

$$F_h := \left(T_{n_2} + P_{n_2}\right)\cdot\cos\left(\theta_{br}\right)$$

$$F_h = 97.28\,\text{kip}$$



From 1999 Record Drawings, S2.5

Beam = W12x26 $F_{y\_bm} := 36\text{ksi}$

Beam Length:

$$L_{bm} := 21\text{ft}$$

C - 34

PDC ENGINEERS
PLAN • DESIGN • CONSTRUCT

Design Sheet

PROJECT: 21156AN - ASD Tier 1
(9 of 11)

Date: 10/27/2021
By: NIC

Moment in beam from net vertical force:

$$M_{br} := \frac{F_v \cdot L_{bm}}{4} = 264.63 \cdot kip \cdot ft$$

$$\phi M_n := 66.826 kip \cdot ft$$

Beam moment capacity calculated with RISA3D with top flange fully braced.

$$\phi P_n := 130.6 kip$$

Beam compression capacity calculated with RISA3D with KL = 10'-6

$$\frac{F_h}{\phi P_n} = 0.74$$

$$DCR_2 := \frac{F_h}{\phi P_n} + \frac{8}{9} \cdot \frac{M_{br}}{\phi M_n} = 426.49 \cdot \%$$

AISC 360-16 (H1-1a)

C - 35

PDC ENGINEERS
PLAN • DESIGN • CONSTRUCT

Design Sheet

PROJECT: 21156AN - ASD Tier 1
(10 of 11)

Date: 10/27/2021
By: NIC

South Fan Room

Brace = TS 3x3x3/16

Brace length:

$$L_{br} := \sqrt{(8.66ft)^2 + (5ft)^2} = 10\,ft$$

Brace angle:

$$\theta_{br} := \operatorname{atan}\left(\frac{5ft}{8.66ft}\right) = 30\cdot deg$$

Brace factored yield strength:

$$T_{n_1} := 78.25kip$$

Brace factored compression strength:

$$P_{n_1} := 37.2kip$$

Net vertical force on beam:

$$F_v := \left(T_{n_1} - P_{n_1}\right)\cdot \sin\left(\theta_{br}\right)$$

$$F_v = 20.53\cdot kip$$

Total horizontal force on beam:

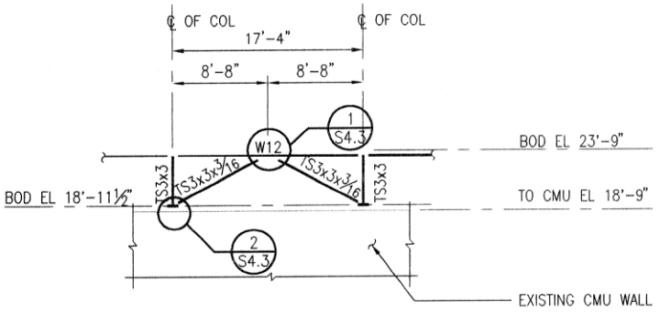
$$F_h := \left(T_{n_1} + P_{n_1}\right)\cdot \cos\left(\theta_{br}\right)$$

$$F_h = 99.98\,kip$$

Beam = W12x26 $\quad F_{y\_bm} := 36ksi$

Beam Length:

$$L_{bm} := 17.33ft$$



SOUTH FAN ROOM BRACE
SCALE: 1/8" = 1'-0"

From 1999 Record Drawings, S2.5

C - 36

PDC ENGINEERS
PLAN • DESIGN • CONSTRUCT

Design Sheet

PROJECT: 21156AN - ASD Tier 1
(11 of 11)

Date: 10/27/2021
By: NIC

Moment in beam from net vertical force:

$$M_{br} := \frac{F_v \cdot L_{bm}}{4} = 88.93 \cdot kip \cdot ft$$

$$\phi M_n := 66.83 kip \cdot ft$$

Beam moment capacity calculated with RISA3D with top flange fully braced.

$$\phi P_n := 138.2 kip$$

Beam compression capacity calculated with RISA3D with KL = 8'-8"

$$\frac{F_h}{\phi P_n} = 0.72$$

$$DCR_3 := \frac{F_h}{\phi P_n} + \frac{8}{9} \cdot \frac{M_{br}}{\phi M_n} = 190.62 \cdot \%$$

AISC 360-16 (H1-1a)

All braced frame beams are unable to resist the vertical load resulting from the simultaneous yielding and buckling of the brace pairs.

Checklist Statement = Non-Conforming

Project:
21156AN - ASD Tier 1
Baxter Elementary - Quick-Checks

C - 37
Name: NIC
Date: 10/26/2021

1 - Shear Wall Properties & Area

Type	Description	Area	X-Dir Tot. Area	Y-Dir Tot. Area
Wx		in^2/ft	in^2	in^2
W1	6" CMU Fully grouted, Detail 1/S6 1973 Record Dwg	67.5	5231	7594
W2	8" CMU Grouted @ 24" OC	51.3	70608	70813
W3	12" CMU Grouted 16" OC	87.3	0	17443
W4	12" CMU Grouted 24" OC	68.2	4032	5294
		Total	79872	101144

2 - Shear Wall Areas: Low Roof

Length X- Dir: (East - West)							Length Y- Dir: (North - South)					
W1	W2	W3	W4				W1	W2	W3	W4		
ft	ft	ft	ft				ft	ft	ft	ft		
47	1113	0	23				46	1274	103	33		
47	1113	0	23			<< Total >>	46	1274	103	33		
3139	57116	0	1594			<< Area >>	3071	65375	8948	2242		

3 - Shear Wall Areas: High Roof

Length X- Dir: (East - West)							Length Y- Dir: (North - South)					
W1	W2	W3	W4				W1	W2	W3	W4		
ft	ft	ft	ft				ft	ft	ft	ft		
0	263	0	35.75				0	106	97.3	44.75		
0	263	0	35.75			<< Total >>	0	106	97.3	44.75		
0	13492	0	2438			<< Area >>	0	5438	8494	3052		

4 - Shear Wall Areas: Penthouse Roof

Length X- Dir: (East - West)							Length Y- Dir: (North - South)					
W1	W2	W3	W4				W1	W2	W3	W4		
ft	ft	ft	ft				ft	ft	ft	ft		
31	0	0	0				67	0	0	0		
31	0	0	0			<< Total >>	67	0	0	0		
2093	0	0	0			<< Area >>	4523	0	0	0		

Project:
21156AN - ASD Tier 1
RM1 Quick Checks

C - 39
Name: NIC
Date: 10/27/2021

1.0 Shear Stress Checks

Area	Trib. Seismic Shear *(kip)*	E-W SW Area *(in^2)*	N-S SW Area *(in^2)*	Max Stress *(psi)*	Comments
Low Roof	5361	61849	79637	23.1	Low roof
High Roof	1782	15930	16984	29.8	High Roof
Central Penthouse	300	2093	4523	38.2	Central Penthouse
Total	7442	79872	101144		
Maximum Stress (psi)				**38.2**	**< 70 psi, ASCE 41-17 (4-7)**

System Modification Factor, Ms 3.75 Average of LS and CP

Project:
21156AN - ASD Tier 1
Quick-Checks

C - 40
Name: NIC
Date: 10/27/2021

2.0 Reinforcement Ratio Checks

Wall Type	Net Area (in2/ft)	Vertical Bars				Horizontal Bars				Total Ratio	Comments
		Size (#)	Max Spacing (in)	Area (in2/ft)	Ratio	Size (#)	Max Spacing (in)	Area (in2/ft)	Ratio		
W1	67.5	4	24	0.09817	0.00145	4	32.0	0.07363	0.00109	0.00255	(1973) 6", fully grouted
W2	62	5	32	0.11505	0.00186	5	40.0	0.09204	0.00148	0.00334	(1973) 8", grouted 16" OC
W3	91.5	4	24	0.09817	0.00107	5	40.0	0.09204	0.00101	0.00208	(1973) 8", fully Grouted
W4	87.3	5	16	0.23010	0.00264	5	20.0	0.18408	0.00211	0.00474	(1973) 12", grouted 16" OC
W5	51.3	5	24	0.15340	0.00299	4	24.0	0.09817	0.00191	0.00490	(1999) 8", grouted 24" OC
W6	68.2	5	24	0.15340	0.00225	4	24.0	0.09817	0.00144	0.00369	(1999) 12", grouted 24" OC

< 70 psi, ASCE 41-17 (4-7)

Minimum total reinforcing steel ratio: 0.00208
Minimum reinforcing steel ratio in either direction: 0.00101
Maximum reinforcing spacing (in): 40

Project:
21156AN - ASD Tier 1
Quick-Checks

C - 41
Name: NIC
Date: 10/27/2021

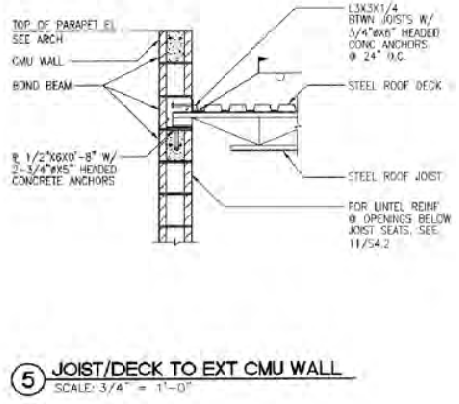
Inputs		
Ψ	1.15	Average of CP and LS
Sxs	1.565	BSE-2E

Exterior walls missing out-of-plane connections :

Areas A & B - Grids B& D; Corridor end walls
Admin and Boiler Room - Plan west and south walls
MPR - North wall at upper roof.

Connection	Floor	Grid / Area	Wp (psf)	Spacing (ft)	Trib Height (ft)	Demand (lbf)	Capacity (lbf)	Comments
C1 (1999)	High Roof	M / MPR	90	6.33	10.5	10766	4928	12" CMU, grouted 16" OC
	Low Roof	1 & 12 / E&W Wing	55	6.66	6.5	4285	3537	8" CMU, grouted 24" OC
	South Penthouse	K / South penthouse	55	5.33	si, ASCE 41-1	#VALUE!	3537	8" CMU, grouted 24" OC
	High Roof	L.4 / South penthouse	55	6	6	3564	3537	8" CMU, grouted 24" OC

C1 connections are non-compliant with quick check calculation.



From 1999 Record Drawings 5/S4.1

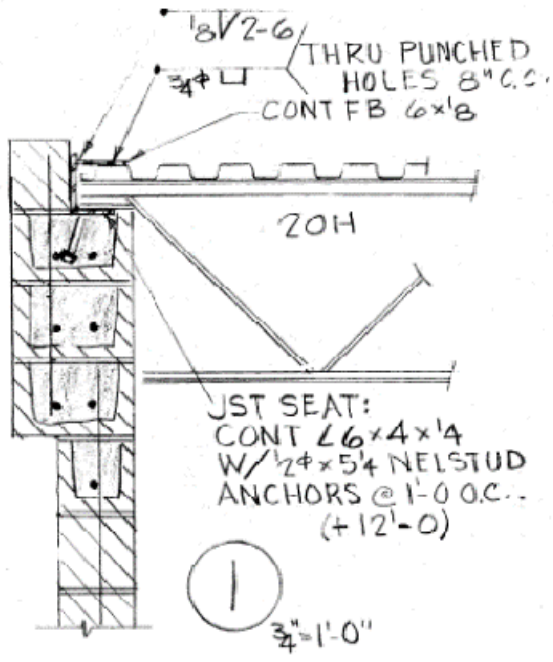
Project:
21156AN - ASD Tier 1
Quick-Checks

C - 42
Name: NIC
Date: 10/27/2021

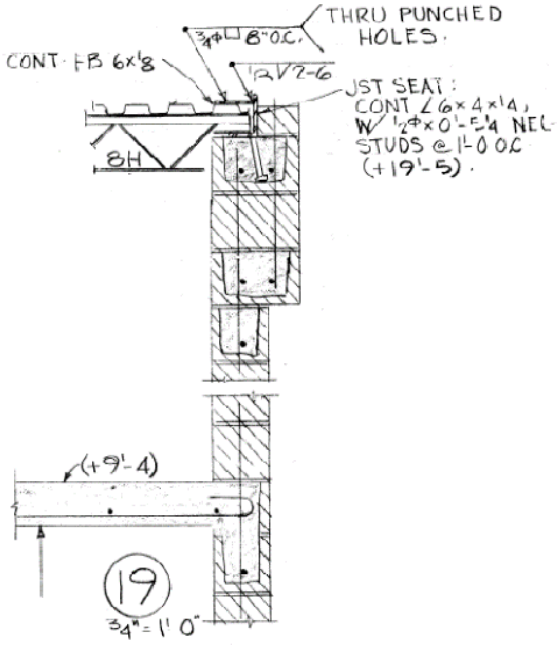
Connection	Floor	Grid / Area	Wp (psf)	Spacing (ft)	Trib Height (ft)	Demand (lbf)	Capacity (lbf)	Comments
C2 (1973)	Low Roof	A,C,E / Area A, B	63	5	6.5	3685	6000	8" CMU, grouted 16" OC
	Low Roof	B / Area C	86	5	6.5	5030	6000	8" CMU, Fully grouted
	High Roof	H / South Penthouse	86	5	6	4643	6000	8" CMU, Fully grouted

C2 connections are compliant with quick check calculation.

Note: The above connection capacity is based on an assumed 2.5" top chord leg size for the connecting joist and constructed per Vulcraft. It is likely for many of the connecting joists, this is not the case. This calculation would require further investigation to ensure accuracy of the capacity.



From 1973 Record Drawings, 1/S4



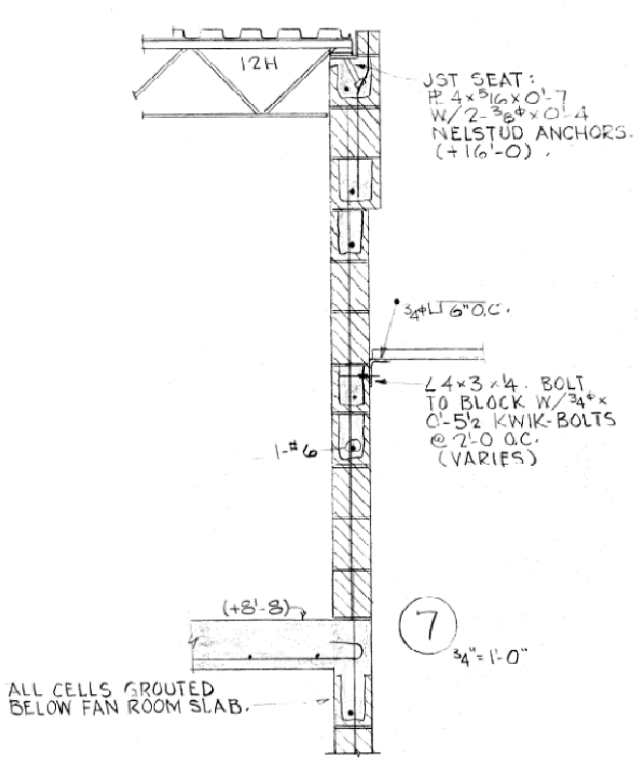
From 1973 Record Drawings, 19/S4

Project:
21156AN - ASD Tier 1
Quick-Checks

C - 43
Name: NIC
Date: 10/27/2021

Connection	Floor	Grid / Area	Wp (psf)	Spacing (ft)	Trib Height (ft)	Demand (lbf)	Capacity (lbf)	Comments
C3 (1973)	Old Central Penthouse	7.3 & 7.6 / Area C	64	4.66	6.5	3489	3540	6" CMU, fully grouted

C3 connections are compliant with quick check calculation.



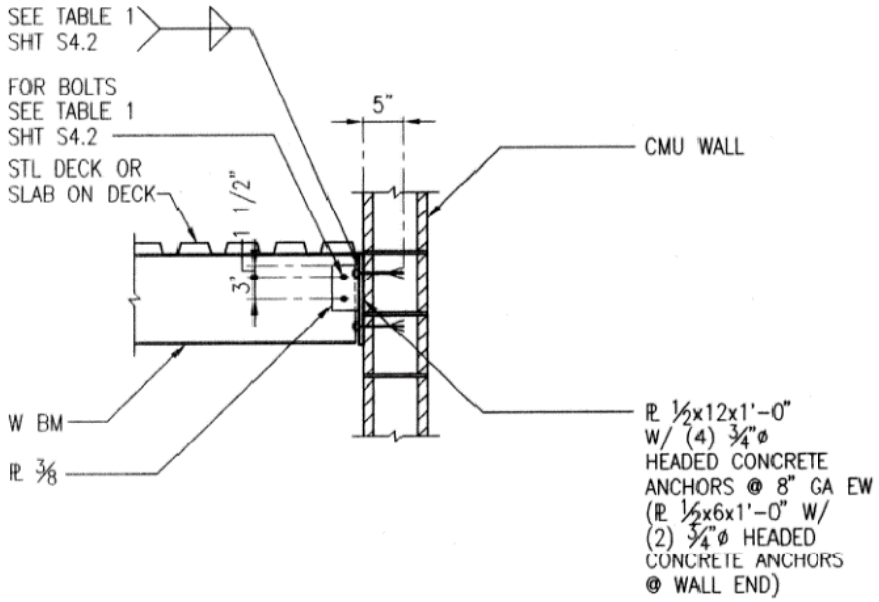
From 1973 Record Drawings, 7/S4

Project:
21156AN - ASD Tier 1
Quick-Checks

C - 44
Name: NIC
Date: 10/27/2021

Connection	Floor	Grid / Area	Wp (psf)	Spacing (ft)	Trib Height (ft)	Demand (lbf)	Capacity (lbf)	Comments
C4 (1999)	South Penthouse	K / Southpenthouse	55	7	si, ASCE 41-1	#VALUE!	11920	8" CMU, grouted 24" OC
	Upper Roof	K / Southpenthouse	55	14	6	8315	11920	8" CMU, grouted 24" OC

C4 connections are compliant with quick check calculation.



12 W BEAM TO CMU WALL
SCALE: 1" = 1'-0"

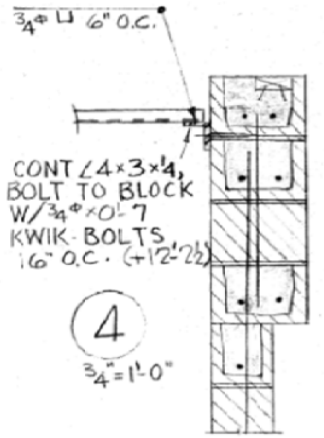
From 1999 Record Drawings, 12/S4.4

Project:
21156AN - ASD Tier 1
Quick-Checks

C - 45
Name: NIC
Date: 10/27/2021

Connection	Floor	Grid / Area	Wp (psf)	Spacing (ft)	Trib Height (ft)	Demand (lbf)	Capacity (lbf)	Comments
C5 (1973)	Low Roof	6 & 9 / Area C	63	1.333	6.5	982	1142	8" CMU, grouted 16" OC
	Low Roof	3 & 10 / Area C & D	63	1.333	6.5	982	1142	8" CMU, grouted 16" OC

C5 connections are compliant with quick check calculation.



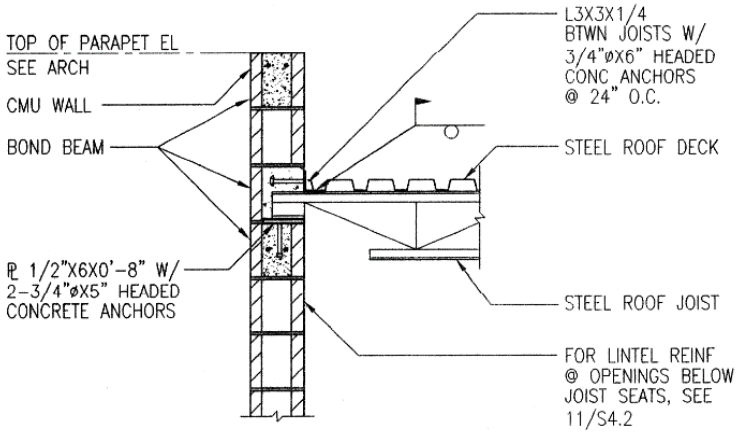
From 1973 Record Drawings, 4/S4

C - 46

ASD Tier 1 Inspections: Baxter Elementary 21156AN	Respec 2700 Gambell St. Suite 500 Anchorage, AK 99503 T: (907) 743-3200	Designed By: Nathaniel I. Cox Date: 10/27/2021

ASCE 41-17 Quick-Checks:
Exterior CMU Out-of-Plane Connection Capacity

Connection - C1:



5 JOIST/DECK TO EXT CMU WALL
SCALE: 3/4" = 1'-0"

1999 Record Drawings - 5/S4.1

1/27

PDC INC. ENGINEERS

C - 47

ASD Tier 1 Inspections: Baxter Elementary 21156AN	Respec 2700 Gambell St. Suite 500 Anchorage, AK 99503 T: (907) 743-3200	Designed By: Nathaniel I. Cox Date: 10/27/2021

Connection Strengths and Geometry - 8" Wall

Masonry

$f'_m := 1500psi$ — *Record Drawings, 1999 S0.1*

Anchors

$f_y := 49ksi$ — Headed stud yield strength

$l_b := 4.5in$ — Length of embedment

$l_e := \frac{7.625in}{2} = 3.81 \cdot in$ — Edge distance of anchor *Assumed*

$d_b := \frac{3}{4}in$ — Diameter of anchor

$n_b := 2$ — Number of anchors

$s_b := 5in$ — Anchor spacing within connection *Assumed*

$A_b := \frac{\pi}{4} \cdot \left(d_b\right)^2 = 0.44 \cdot in^2$ — Cross-sectional area of anchor

Joists

$D_w := 3$ — Weld size to seat (1/16")

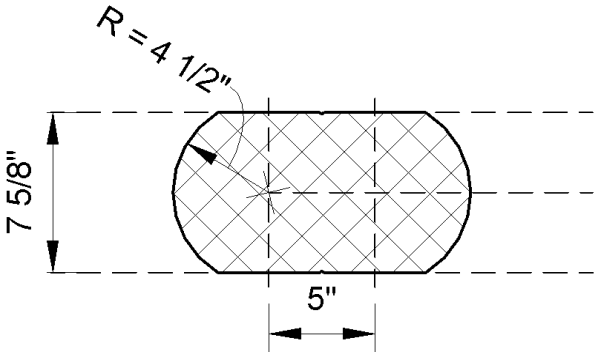
$L_w := 2in \cdot 2$ — Total length of weld to seat

ASD Tier 1 Inspections: Baxter Elementary 21156AN	Respec 2700 Gambell St. Suite 500 Anchorage, AK 99503 T: (907) 743-3200	Designed By: Nathaniel I. Cox Date: 10/27/2021

Anchor Projected Areas

Tension

$A'_{pt} := 0.68ft^2 = 97.92 \cdot in^2$



Above - Tension cone overlapped area

Shear

$l_{be} := \min(l_e, l_b) = 3.81 \cdot in$

$A_{pv} := \pi \cdot \frac{l_{be}^2}{2}$

Projected shear area of a single anchor

$\theta := \operatorname{acos}\left(\frac{s_b}{2 \cdot l_{be}}\right) = 49.02 \cdot deg$

$A_o := \begin{cases} l_b^2 \cdot \left[\pi \cdot \frac{(2 \cdot \theta)}{180deg} - \sin(2 \cdot \theta)\right] & \text{if } n_b > 1 \\ 0 \end{cases}$

Area of overtapping shear zones

$A_o = 0$

$A'_{pv} := \begin{cases} A_{pv} & \text{if } n_b = 1 \\ n_b \cdot A_{pv} & \text{if } s_b \geq 2 \cdot l_{be} \\ n_b \cdot A_{pv} - (n_b - 1) \cdot A_o & \text{otherwise} \end{cases} = 45.66 \cdot in^2$

Projected shear area of anchor group

PDC INC. ENGINEERS

ASD Tier 1 Inspections: Baxter Elementary 21156AN	Respec 2700 Gambell St. Suite 500 Anchorage, AK 99503 T: (907) 743-3200	Designed By: Nathaniel I. Cox Date: 10/27/2021

Anchorage Capacity

Masonry Shear Breakout

$$\phi B_{vnb} := 0.5 \cdot 4 \cdot A'_{pv} \cdot \sqrt{f'_m \cdot \frac{1}{psi}} \cdot psi = 3.54 \cdot kip$$

TMS 402-16 (Equation 9-6)

Masonry Shear Crushing

$$\phi B_{vnc} := 2 \cdot 0.5 \cdot 1050 \cdot \left(f'_m \cdot A_b \right)^{\frac{1}{4}} \cdot lbf^{\frac{3}{4}} = 5.33 \cdot kip$$

TMS 402-16 (Equation 9-7)

Anchor Shear Pryout

$$\phi B_{vnpry} := 0.5 \cdot 8 \cdot A'_{pt} \cdot \sqrt{f'_m \cdot \frac{1}{psi}} \cdot psi = 15.17 \cdot kip$$

TMS 402-16 (Equation 9-7)

Anchor Shear Yielding

$$\phi B_{vns} := n_b \cdot 0.9 \cdot 0.6 \cdot A_b \cdot f_y = 23.38 \cdot kip$$

TMS 402-16 (Equation 9-8)

Limiting Capacity Per Anchor Group

$$\phi B_{nv} := \min\left(\phi B_{vnb}, \phi B_{vnc}, \phi B_{vnpry}, \phi B_{vns} \right) = 3.54 \cdot kip$$

C - 50

ASD Tier 1 Inspections: Baxter Elementary 21156AN	Respec 2700 Gambell St. Suite 500 Anchorage, AK 99503 T: (907) 743-3200	Designed By: Nathaniel I. Cox Date: 10/27/2021

Joist Connection Capacity

Weld Capacity

$$\phi R_{n\_w} := 1.392 \cdot D_w \cdot L_w \cdot kpi = 16.7 \cdot kip$$

Seat Axial Capacity

$$\phi P_n = \begin{cases} 6kip & \text{if } l = 2.5in \\ 12kip & \text{if } l = 3in \\ 15kip & \text{if } l \geq 3.5in \end{cases}$$

Maximum horizontal load for 7.5in deep seats based on joist girder top chord leg size
Designing with Vulcraft, pg 125

Assuming the minimum joist top chord leg size is 2.5in (further investigation would be required):

$$\phi P_n := 6kip$$

Connection Capacity

$$\phi R_n := \min\left(\phi B_{nv}, \phi R_{n\_w}, \phi P_n\right) = 3537.08\,lbf$$ For 8" Wall

5/27

PDC INC. ENGINEERS

C - 51

ASD Tier 1 Inspections: Baxter Elementary 21156AN	Respec 2700 Gambell St. Suite 500 Anchorage, AK 99503 T: (907) 743-3200	Designed By: Nathaniel I. Cox Date: 10/27/2021

Connection Strengths and Geometry - 12" Wall

Masonry

$f'_m := 1500psi$ — *Record Drawings, 1999 S0.1*

Anchors

$f_y := 49ksi$ — Headed stud yield strength

$l_b := 4.5in$ — Length of embedment

$l_e := \frac{11.625in}{2} = 5.81 \cdot in$ — Edge distance of anchor *Assumed*

$d_b := \frac{3}{4}in$ — Diameter of anchor

$n_b := 2$ — Number of anchors

$s_b := 5in$ — Anchor spacing within connection *Assumed*

$n_t := 10$ — Number of threads per inch *Course threaded, assumed*

$A_b := \frac{\pi}{4} \cdot \left(d_b\right)^2 = 0.44 \cdot in^2$ — Cross-sectional area of anchor

Joists

$D_w := 3$ — Weld size to seat (1/16")

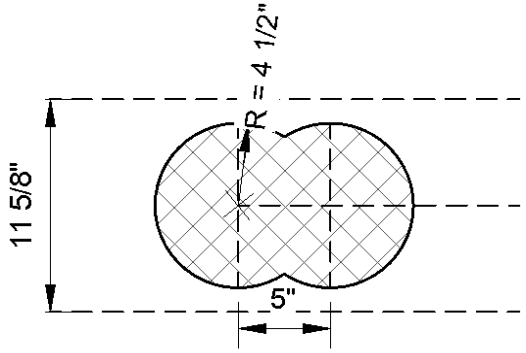
$L_w := 2in \cdot 2$ — Total length of weld to seat

ASD Tier 1 Inspections: Baxter Elementary 21156AN	Respec 2700 Gambell St. Suite 500 Anchorage, AK 99503 T: (907) 743-3200	Designed By: Nathaniel I. Cox Date: 10/27/2021

Anchor Projected Areas

Tension

$A'_{pt} := 0.74ft^2 = 106.56 \cdot in^2$



Above - Tension cone overlapped area

Shear

$l_{be} := \min(l_e, l_b) = 4.5 \cdot in$

$A_{pv} := \pi \cdot \frac{l_{be}^2}{2}$

Projected shear area of a single anchor

$\theta := \operatorname{acos}\left(\frac{s_b}{2 \cdot l_{be}}\right) = 56.25 \cdot deg$

$A_o := \begin{cases} l_b^2 \cdot \left[\pi \cdot \frac{(2 \cdot \theta)}{180deg} - \sin(2 \cdot \theta)\right] & \text{if } n_b > 1 \\ 0 \end{cases}$

Area of overtapping shear zones

$A_o = 0$

$A'_{pv} := \begin{cases} A_{pv} & \text{if } n_b = 1 \\ n_b \cdot A_{pv} & \text{if } s_b \geq 2 \cdot l_{be} \\ n_b \cdot A_{pv} - (n_b - 1) \cdot A_o & \text{otherwise} \end{cases} = 63.62 \cdot in^2$

Projected shear area of anchor group

ASD Tier 1 Inspections: Baxter Elementary 21156AN	Respec 2700 Gambell St. Suite 500 Anchorage, AK 99503 T: (907) 743-3200	Designed By: Nathaniel I. Cox Date: 10/27/2021

Anchorage Capacity

Masonry Shear Breakout

$$\phi B_{vnb} := 0.5 \cdot 4 \cdot A'_{pv} \cdot \sqrt{f'_m \cdot \frac{1}{psi}} \cdot psi = 4.93 \cdot kip$$

TMS 402-16 (Equation 9-6)

Masonry Shear Crushing

$$\phi B_{vnc} := 2 \cdot 0.5 \cdot 1050 \cdot \left(f'_m \cdot A_b \right)^{\frac{1}{4}} \cdot lbf^{\frac{3}{4}} = 5.33 \cdot kip$$

TMS 402-16 (Equation 9-7)

Anchor Shear Pryout

$$\phi B_{vnpry} := 0.5 \cdot 8 \cdot A'_{pt} \cdot \sqrt{f'_m \cdot \frac{1}{psi}} \cdot psi = 16.51 \cdot kip$$

TMS 402-16 (Equation 9-7)

Anchor Shear Yielding

$$\phi B_{vns} := n_b \cdot 0.9 \cdot 0.6 \cdot A_b \cdot f_y = 23.38 \cdot kip$$

TMS 402-16 (Equation 9-8)

Limiting Capacity Per Anchor Group

$$\phi B_{nv} := \min\left(\phi B_{vnb}, \phi B_{vnc}, \phi B_{vnpry}, \phi B_{vns} \right) = 4.93 \cdot kip$$

PDC INC. ENGINEERS

ASD Tier 1 Inspections: Baxter Elementary 21156AN	Respec 2700 Gambell St. Suite 500 Anchorage, AK 99503 T: (907) 743-3200	Designed By: Nathaniel I. Cox Date: 10/27/2021

Joist Connection Capacity

Weld Capacity

$$\phi R_{n\_w} := 1.392 \cdot D_w \cdot L_w \cdot kpi = 16.7 \cdot kip$$

Seat Axial Capacity

$$\phi P_n = \begin{cases} 6kip & \text{if } l = 2.5in \\ 12kip & \text{if } l = 3in \\ 15kip & \text{if } l \geq 3.5in \end{cases}$$

Maximum horizontal load for 7.5in deep seats based on joist girder top chord leg size
Designing with Vulcraft, pg 125

Assuming the minimum joist top chord leg size is 2.5in (further investigation would be required):

$$\phi P_n := 6kip$$

Connection Capacity

$$\phi R_n := \min\left(\phi B_{nv}, \phi R_{n\_w}, \phi P_n\right) = 4927.77\,lbf$$ For 12" Wall

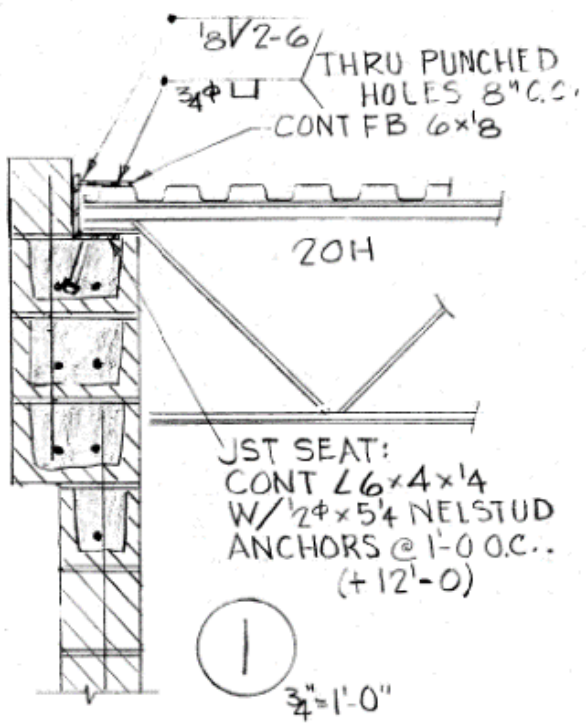
9/27

PDC INC. ENGINEERS

C - 55

ASD Tier 1 Inspections: Baxter Elementary 21156AN	Respec 2700 Gambell St. Suite 500 Anchorage, AK 99503 T: (907) 743-3200	Designed By: Nathaniel I. Cox Date: 10/27/2021

Connection - C2:



1973 Record Drawings - 1/S4

10/27

PDC INC. ENGINEERS

C - 56

ASD Tier 1 Inspections: Baxter Elementary 21156AN	Respec 2700 Gambell St. Suite 500 Anchorage, AK 99503 T: (907) 743-3200	Designed By: Nathaniel I. Cox Date: 10/27/2021

Connection Strengths and Geometry

Masonry

$f'_m := 1500psi$ — *Assumed - Not listed in 1973 record drawings*

Anchors

$f_y := 49ksi$ — Anchor bolt yield strength

$l_b := 5.25in - 0.5in = 4.75 \cdot in$ — Length of embedment

$l_e := \frac{7.625}{2}in = 3.81 \cdot in$ — Edge distance of anchor
Assumed

$d_b := \frac{1}{2}in$ — Diameter of anchor

$n_b := 1$ — Number of anchors
Per 1'-0" interval

$s_b := 12in$ — Anchor spacing within connection

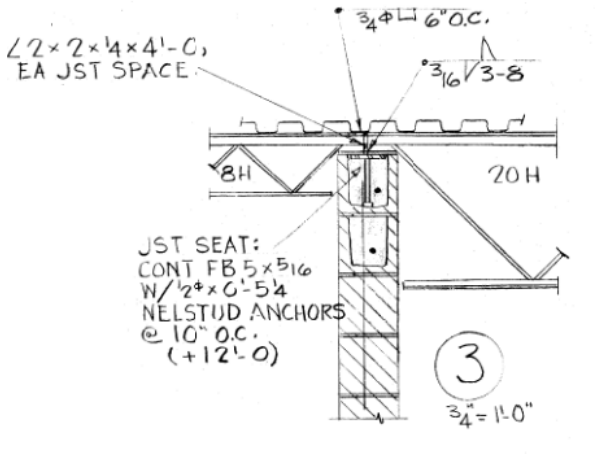
$A_b := \frac{\pi}{4} \cdot \left(d_b\right)^2 = 0.2\,in^2$ — Cross-sectional area of anchor

ASD Tier 1 Inspections: Baxter Elementary 21156AN	Respec 2700 Gambell St. Suite 500 Anchorage, AK 99503 T: (907) 743-3200	Designed By: Nathaniel I. Cox Date: 10/27/2021

Joists

$D_w := 3$ Weld size to seat (1/16")

$L_w := 3in \cdot 2$ Total length of weld to seat



1973 Record Drawings - 3/S4

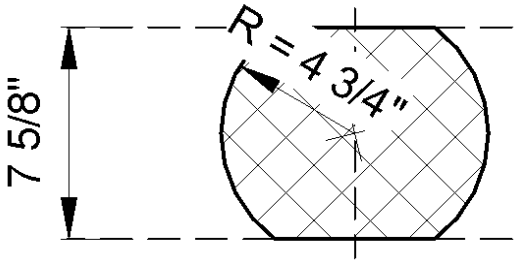
PDC INC. ENGINEERS

ASD Tier 1 Inspections: Baxter Elementary 21156AN	Respec 2700 Gambell St. Suite 500 Anchorage, AK 99503 T: (907) 743-3200	Designed By: Nathaniel I. Cox Date: 10/27/2021

Anchor Projected Areas

Tension

$A'_{pt} := 0.44ft^2 = 63.36 \cdot in^2$



Above - Tension breakout cone

Shear

$l_{be} := \min(l_e, l_b) = 3.81 \cdot in$

$A_{pv} := \pi \cdot \frac{l_{be}^2}{2} = 22.83 \cdot in^2$ Projected shear area of a single anchor

$\theta := \operatorname{acos}\left(\frac{s_b}{2 \cdot l_{be}}\right) = 58.77i \cdot deg$

$A_o := \begin{cases} l_b^2 \cdot \left[\pi \cdot \frac{(2 \cdot \theta)}{180deg} - \sin(2 \cdot \theta)\right] & \text{if } n_b > 1 \\ 0 \end{cases}$ Area of overtapping shear zones

$A_o = 0$

$A'_{pv} := \begin{cases} A_{pv} & \text{if } n_b = 1 \\ n_b \cdot A_{pv} & \text{if } s_b \geq 2 \cdot l_{be} \\ n_b \cdot A_{pv} - (n_b - 1) \cdot A_o & \text{otherwise} \end{cases} = 22.83 \cdot in^2$ Projected shear area of anchor group

PDC INC. ENGINEERS

C - 59

ASD Tier 1 Inspections: Baxter Elementary 21156AN	Respec 2700 Gambell St. Suite 500 Anchorage, AK 99503 T: (907) 743-3200	Designed By: Nathaniel I. Cox Date: 10/27/2021

Anchorage Capacity

Masonry Shear Breakout

$$\phi B_{vnb} := 0.5 \cdot 4 \cdot A'_{pv} \cdot \sqrt{f'_m \cdot \frac{1}{psi}} \cdot psi = 1.77 \cdot kip$$

TMS 402-16 (Equation 9-6)

Masonry Shear Crushing

$$\phi B_{vnc} := n_b \cdot 0.5 \cdot 1050 \cdot \left(f'_m \cdot A_b\right)^{\frac{1}{4}} \cdot lbf^{\frac{3}{4}} = 2.17 \cdot kip$$

TMS 402-16 (Equation 9-7)

Anchor Shear Pryout

$$\phi B_{vnpry} := 0.5 \cdot 8 \cdot A'_{pt} \cdot \sqrt{f'_m \cdot \frac{1}{psi}} \cdot psi = 9.82 \cdot kip$$

TMS 402-16 (Equation 9-7)

Anchor Shear Yielding

$$\phi B_{vns} := n_b \cdot 0.9 \cdot 0.6 \cdot A_b \cdot f_y = 5.2 \cdot kip$$

TMS 402-16 (Equation 9-8)

Limiting Capacity Per Anchor Group

$$\phi B_{nv} := \frac{\min\left(\phi B_{vnb}, \phi B_{vnc}, \phi B_{vnpry}, \phi B_{vns}\right)}{s_b} = 1.77 \frac{1}{ft} \cdot kip$$

C - 60

ASD Tier 1 Inspections: Baxter Elementary 21156AN	Respec 2700 Gambell St. Suite 500 Anchorage, AK 99503 T: (907) 743-3200	Designed By: Nathaniel I. Cox Date: 10/27/2021

Joist Connection Capacity

Joist to Seat Weld Capacity

$$\phi R_{n\_w} := 1.392 \cdot D_w \cdot L_w \cdot kpi = 25.06 \cdot kip$$

Seat Axial Capacity

$$\phi P_n = \begin{cases} 6kip & \text{if } l = 2.5in \\ 12kip & \text{if } l = 3in \\ 15kip & \text{if } l \geq 3.5in \end{cases}$$

Maximum horizontal load for 7.5in deep seats based on joist girder top chord leg size
Designing with Vulcraft, pg 125

Assuming the minimum joist top chord leg size is 2.5in (further investigation would be required):

$$\phi P_n := 6kip$$

Connection Capacity

Joists occur at a maximum of 5'-0"

$$s_j := 5ft$$

$$\phi R_n := \min\left(\phi B_{nv} \cdot s_j, \phi R_{n\_w}, \phi P_n\right) = 6000\,lbf$$

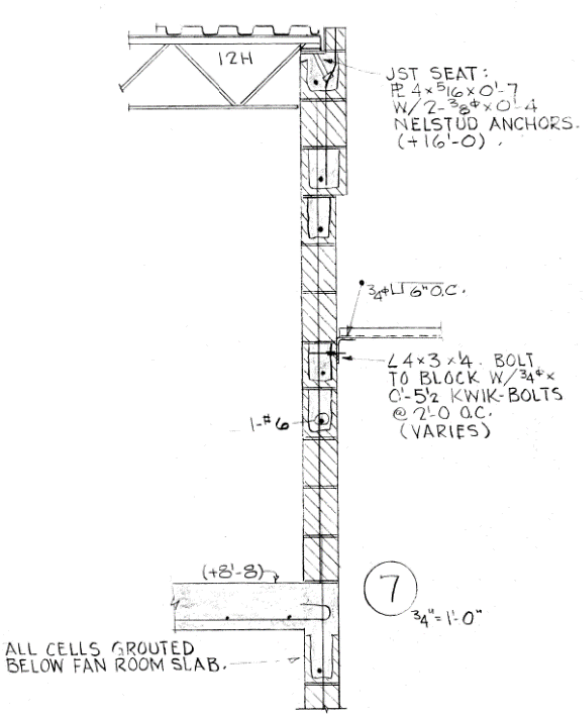
15/27

PDC INC. ENGINEERS

C - 61

ASD Tier 1 Inspections: Baxter Elementary 21156AN	Respec 2700 Gambell St. Suite 500 Anchorage, AK 99503 T: (907) 743-3200	Designed By: Nathaniel I. Cox Date: 10/27/2021

Connection - C3:



1973 Record Drawings - 7/S4

16/27

PDC INC. ENGINEERS

C - 62

ASD Tier 1 Inspections: Baxter Elementary 21156AN	Respec 2700 Gambell St. Suite 500 Anchorage, AK 99503 T: (907) 743-3200	Designed By: Nathaniel I. Cox Date: 10/27/2021

Connection Strengths and Geometry

Masonry

$f'_m := 1500psi$ — *Assumed - Not listed in 1973 record drawings*

Anchors

$f_y := 49ksi$ — Anchor bolt yield strength

$l_b := 5.25in - 0.375in = 4.88 \cdot in$ — Length of embedment

$l_e := \frac{7.625in}{2} = 3.81 \cdot in$ — Edge distance of anchor
Assumed

$d_b := \frac{3}{8}in$ — Diameter of anchor

$n_b := 2$ — Number of anchors

$s_b := 4in - 2 \cdot (0.75in) = 2.5 \cdot in$ — Anchor spacing within connection
Assumed

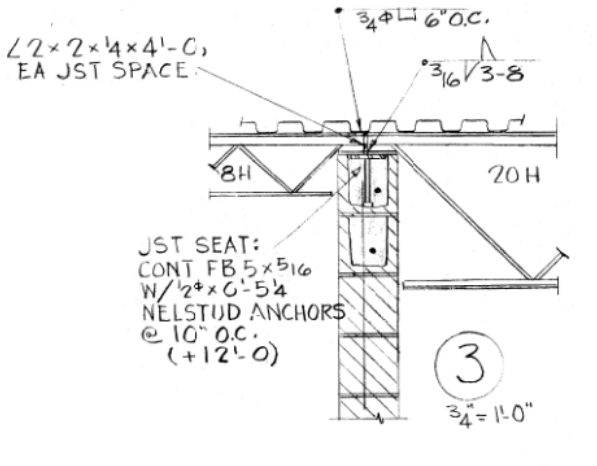
$A_b := \frac{\pi}{4} \cdot (d_b)^2 = 0.11\,in^2$ — Cross-sectional area of anchor

ASD Tier 1 Inspections: Baxter Elementary 21156AN	Respec 2700 Gambell St. Suite 500 Anchorage, AK 99503 T: (907) 743-3200	Designed By: Nathaniel I. Cox Date: 10/27/2021

Joists

$D_w := 3$ Weld size to seat (1/16")

$L_w := 3in \cdot 2$ Total length of weld to seat



1973 Record Drawings - 3/S4

PDC INC. ENGINEERS

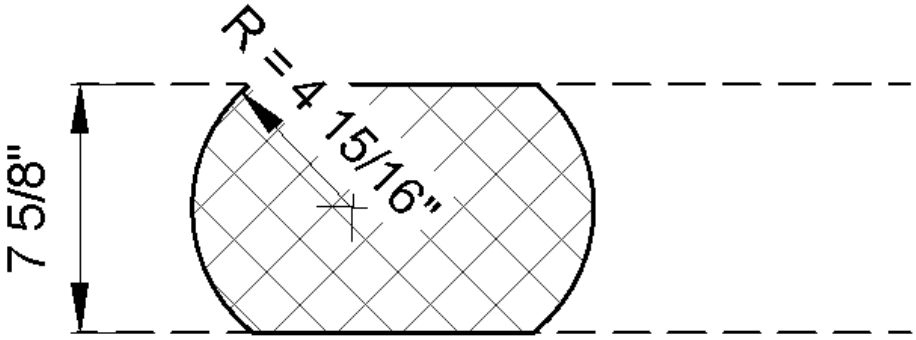
C - 64

ASD Tier 1 Inspections: Baxter Elementary 21156AN	Respec 2700 Gambell St. Suite 500 Anchorage, AK 99503 T: (907) 743-3200	Designed By: Nathaniel I. Cox Date: 10/27/2021

Anchor Projected Areas

Tension

$A'_{pt} := 0.59ft^2 = 84.96 \cdot in^2$



Above - Tension breakout cone

Shear

$l_{be} := \min(l_e, l_b) = 3.81 \cdot in$

$A_{pv} := \pi \cdot \frac{l_{be}^2}{2} = 22.83 \cdot in^2$ Projected shear area of a single anchor

$\theta := \operatorname{acos}\left(\frac{s_b}{2 \cdot l_{be}}\right) = 70.86 \cdot deg$

$A_o := \begin{cases} l_b^2 \cdot \left[\pi \cdot \frac{(2 \cdot \theta)}{180deg} - \sin(2 \cdot \theta)\right] & \text{if } n_b > 1 \\ 0 \end{cases}$ Area of overtapping shear zones

$A_o = 0$

$A'_{pv} := \begin{cases} A_{pv} & \text{if } n_b = 1 \\ n_b \cdot A_{pv} & \text{if } s_b \geq 2 \cdot l_{be} \\ n_b \cdot A_{pv} - (n_b - 1) \cdot A_o & \text{otherwise} \end{cases} = 45.66 \cdot in^2$ Projected shear area of anchor group

C - 65

ASD Tier 1 Inspections: Baxter Elementary 21156AN	Respec 2700 Gambell St. Suite 500 Anchorage, AK 99503 T: (907) 743-3200	Designed By: Nathaniel I. Cox Date: 10/27/2021

Anchorage Capacity

Masonry Shear Breakout

$$\phi B_{vnb} := 0.5 \cdot 4 \cdot A'_{pv} \cdot \sqrt{f'_m \cdot \frac{1}{psi}} \cdot psi = 3.54 \cdot kip$$

TMS 402-16 (Equation 9-6)

Masonry Shear Crushing

$$\phi B_{vnc} := n_b \cdot 0.5 \cdot 1050 \cdot \left(f'_m \cdot A_b\right)^{\frac{1}{4}} \cdot lbf^{\frac{3}{4}} = 3.77 \cdot kip$$

TMS 402-16 (Equation 9-7)

Anchor Shear Pryout

$$\phi B_{vnpry} := 0.5 \cdot 8 \cdot A'_{pt} \cdot \sqrt{f'_m \cdot \frac{1}{psi}} \cdot psi = 13.16 \cdot kip$$

TMS 402-16 (Equation 9-7)

Anchor Shear Yielding

$$\phi B_{vns} := n_b \cdot 0.9 \cdot 0.6 \cdot A_b \cdot f_y = 5.84 \cdot kip$$

TMS 402-16 (Equation 9-8)

Limiting Capacity Per Anchor Group

$$\phi B_{nv} := \min\left(\phi B_{vnb}, \phi B_{vnc}, \phi B_{vnpry}, \phi B_{vns}\right) = 3.54 \cdot kip$$

C - 66

ASD Tier 1 Inspections: Baxter Elementary 21156AN	Respec 2700 Gambell St. Suite 500 Anchorage, AK 99503 T: (907) 743-3200	Designed By: Nathaniel I. Cox Date: 10/27/2021

Joist Connection Capacity

Joist to Seat Weld Capacity

$$\phi R_{n\_w} := 1.392 \cdot D_w \cdot L_w \cdot kpi = 25.06 \cdot kip$$

Seat Axial Capacity

$$\phi P_n = \begin{cases} 6kip & \text{if } l = 2.5in \\ 12kip & \text{if } l = 3in \\ 15kip & \text{if } l \geq 3.5in \end{cases}$$

Maximum horizontal load for 7.5in deep seats based on joist girder top chord leg size
Designing with Vulcraft, pg 125

Assuming the minimum joist top chord leg size is 2.5in (further investigation would be required):

$$\phi P_n := 6kip$$

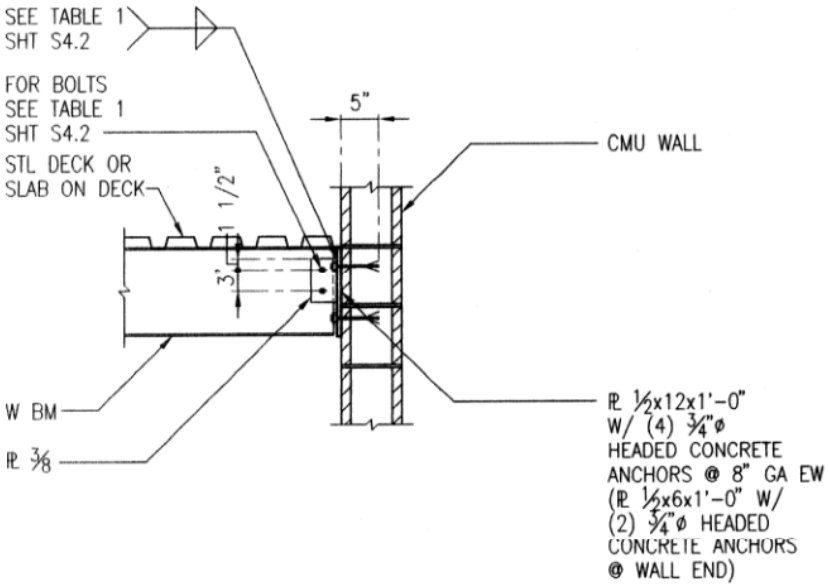
Connection Capacity

$$\phi R_n := \min\left(\phi B_{nv}, \phi R_{n\_w}, \phi P_n\right) = 3537.08\,lbf$$

C - 67

ASD Tier 1 Inspections: Baxter Elementary 21156AN	Respec 2700 Gambell St. Suite 500 Anchorage, AK 99503 T: (907) 743-3200	Designed By: Nathaniel I. Cox Date: 10/27/2021

Connection - C4:



12 W BEAM TO CMU WALL
SCALE: 1" = 1'-0"

1999 Record Drawings - 12/S4.4

PDC INC. ENGINEERS

C - 68

ASD Tier 1 Inspections: Baxter Elementary 21156AN	Respec 2700 Gambell St. Suite 500 Anchorage, AK 99503 T: (907) 743-3200	Designed By: Nathaniel I. Cox Date: 10/27/2021

Connection Strengths and Geometry

Masonry

$f'_m := 1500psi$ — *Record Drawings, 1999 S0.1*

Anchors

$f_y := 49ksi$ — Anchor bolt yield strength

$l_b := 4in - 0.5in = 3.5 \cdot in$ — Length of embedment

$l_e := l_b = 3.5 \cdot in$ — Edge distance of anchor

$d_b := \frac{3}{4}in$ — Diameter of anchor

$n_b := 4$ — Number of anchors

$s_b := 8in$ — Anchor spacing within connection

$A_b := \frac{\pi}{4} \cdot \left(d_b\right)^2 = 0.44\,in^2$ — Cross-sectional area of anchor

ASD Tier 1 Inspections: Baxter Elementary 21156AN	Respec 2700 Gambell St. Suite 500 Anchorage, AK 99503 T: (907) 743-3200	Designed By: Nathaniel I. Cox Date: 10/27/2021

Anchor Projected Areas

Tension

$A_{pt} := \pi \cdot l_b^2 = 38.48 \cdot in^2$

Projected tension area of a single anchor

$\theta := \operatorname{acos}\left(\frac{s_b}{2 \cdot l_b}\right) = 30.27i \cdot deg$

$A_o := \begin{cases} l_b^2 \cdot \left[\pi \cdot \frac{(2 \cdot \theta)}{180deg} - \sin(2 \cdot \theta)\right] & \text{if } n_b > 1 \\ 0 & \text{otherwise} \end{cases}$

$A_o = -2.55i \cdot in^2$

Area of overtapping tension zones

$A'_{pt} := \begin{cases} A_{pt} & \text{if } n_b = 1 \\ n_b \cdot A_{pt} & \text{if } s_b \geq 2 \cdot l_b \\ n_b \cdot A_{pt} - (n_b - 1) \cdot A_o & \text{otherwise} \end{cases} = 153.94 \cdot in^2$

Projected tension area of anchor group

C - 70

ASD Tier 1 Inspections: Baxter Elementary 21156AN	Respec 2700 Gambell St. Suite 500 Anchorage, AK 99503 T: (907) 743-3200	Designed By: Nathaniel I. Cox Date: 10/27/2021

Anchorage Capacity

Masonry Tensile Breakout

$$\phi B_{tnb} := 0.5 \cdot 4 \cdot A'_{pt} \cdot \sqrt{f'_m \cdot \frac{1}{psi}} \cdot psi = 11.92 \cdot kip$$

TMS 402-16 (Equation 9-1)

Steel Anchor Tensile Yielding

$$\phi B_{tnc} := n_b \cdot 0.9 \cdot A_b \cdot f_y = 77.93 \cdot kip$$

TMS 402-16 (Equation 9-2)

Total

$$\phi B_{tn} := \min\left(\phi B_{tnb}, \phi B_{tnc}\right) = 11.92 \cdot kip$$

Beam Connection

Minimum beam size for connection is W12.

TABLE 1
SINGLE-PLATE SHEAR CONNECTIONS

BEAM SIZES	HSB REQ	SHEAR PL THICKNESS	WELD SIZE	HSB SIZE & TYPE
W8 TO W12	2	3/8"	5/16"	3/4"ø – A325N
W14 TO W18	3	3/8"	5/16"	3/4"ø – A325N
W21 TO W24	4	3/8"	5/16"	3/4"ø – A325N
W27 TO W30	5	3/8"	5/16"	3/4"ø – A325N
W33 TO W36	6	3/8"	5/16"	3/4"ø – A325N

NOTES:

1. ALL HSB TO BE FULLY TIGHTENED.
2. FABRICATE SHEAR PLATES WITH HORIZ SHORT–SLOTTED HOLES AND BEAMS WITH STANDARD HOLES.
3. HSB VERT SPACING = 3" MIN. EDGE DIST. = 1½" MIN.

1999 Record Drawings - 1/S4.2

By inspection, beam connection will not be limiting.

Connection Capacity

$$\phi B_n := \phi B_{tn} = 11.92 \cdot kip$$

25/27

PDC INC. ENGINEERS

C - 71

ASD Tier 1 Inspections: Baxter Elementary 21156AN	Respec 2700 Gambell St. Suite 500 Anchorage, AK 99503 T: (907) 743-3200	Designed By: Nathaniel I. Cox Date: 10/27/2021

Connection - C5:

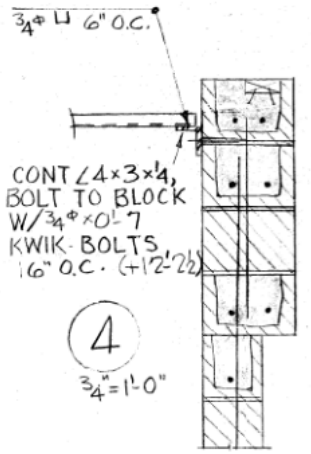
4 & 17/S4 (1973)

Connection to Decking

Per Verco Steel Deck Wall Anchorage Design Tool

Assuming 50ksi decking material.

$U := 21\%$



1973 Record Drawings - 1/S4

Angle Flexure

Assume only back leg resists flexure (conservative)

$t_a := 0.25in$ Thickness of angle

$F_y := 36ksi$ Strength of angle

$F_u := 58ksi$

$b := 16in$ Effective width of angle

$Z := \frac{b \cdot t_a^2}{4} = 0.25 \cdot in^3$ Effective plastic neutral axis

$\phi M_n := 0.9 \cdot F_y \cdot Z = 0.68\,ft \cdot kip$

$\phi P_n := \frac{4 \cdot \phi M_n}{b} = 2025\,lbf$

ASD Tier 1 Inspections: Baxter Elementary 21156AN	Respec 2700 Gambell St. Suite 500 Anchorage, AK 99503 T: (907) 743-3200	Designed By: Nathaniel I. Cox Date: 10/27/2021

Angle Prying Action

$T_u := 982lbf$ Ultimate tension on anchor

$d_b := 0.75in$ Diameter of anchor

$b := 2in$

$b' := b - \frac{d_b}{2} = 1.63 \cdot in$

$p := \min\left(\frac{16in}{2}, 1.75 \cdot b\right) = 3.5 \cdot in$

$t_{np} := \sqrt{\frac{4 \cdot T_u \cdot b'}{0.9 \cdot p \cdot F_u}} = 0.19 \cdot in$ *AISC SCM 15th (9-17a)*

No prying action will occur.

Anchor

Per Hilti Profis

$U := 86\%$

PDC INC. ENGINEERS

C - 73

Hilti PROFIS Engineering 3.1.1

www.hilti.com

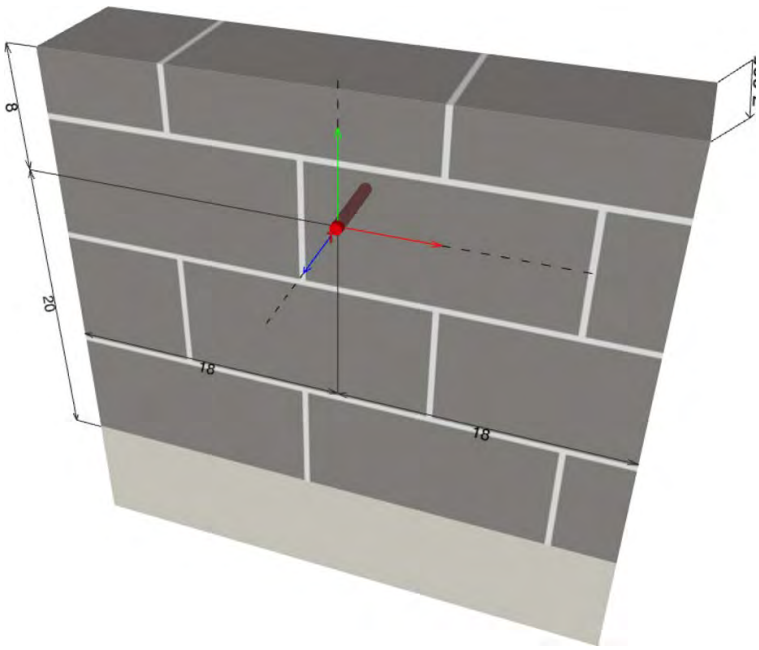
Company:	Respec Engineering	Page:	1
Address:	2700 Gambell Street Suite 500	Specifier:	NIC
Phone I Fax:	|	E-Mail:	nathaniel.cox@respec.com
Design:	Baxter - RM1/2 - Top of Exterior wall - C5 Connection	Date:	10/22/2021
Fastening point:			

Specifier's comments: RM1 Quick-checks:Top of Wall AnchorageC5 Connection

1 Input data

Anchor type and diameter:	**Kwik Bolt TZ2 - CS 3/4 (4 3/4)**
Item number:	2210311 KB-TZ2 3/4x5 1/2
Effective embedment depth:	h_{ef} = 4.750 in.
Material:	Carbon Steel
Evaluation Service Report:	ESR-4561
Issued I Valid:	3/1/2021 | 12/1/2021
Proof:	Design Method ASD Masonry
Stand-off installation:	
Profile:	
Base material:	Grout-filled CMU, L x W x H: 16.000 in. x 8.000 in. x 8.000 in.; Joints: vertical: 0.375 in.; horizontal: 0.375 in. Base material temperature: 68 °F
Installation:	Face installation
Seismic loads	yes

Geometry [in.]



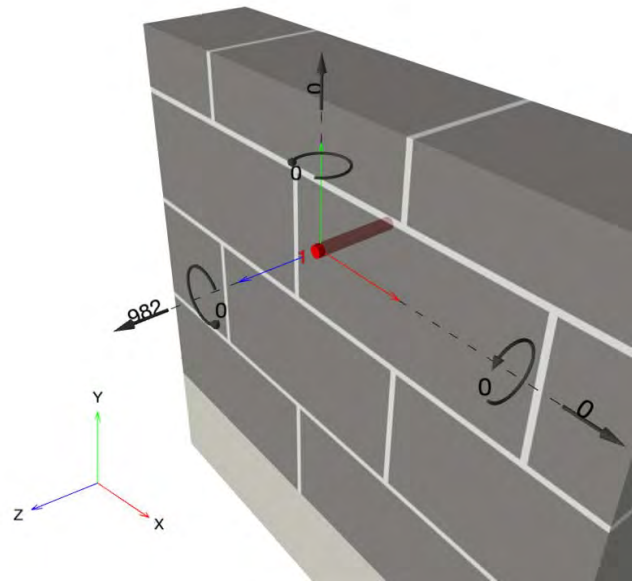
C - 74

Hilti PROFIS Engineering 3.1.1

www.hilti.com

Company:	Respec Engineering	Page:	2
Address:	2700 Gambell Street Suite 500	Specifier:	NIC
Phone I Fax:	|	E-Mail:	nathaniel.cox@respec.com
Design:	Baxter - RM1/2 - Top of Exterior wall - C5 Connection	Date:	10/22/2021
Fastening point:			

Geometry [in.] & Loading [lb, in.lb]



1.1 Design results

Case	Description	Forces [lb] / Moments [in.lb]	Seismic	Max. Util. Anchor [%]
1	Combination 1	N = 982; V_x = 0; V_y = 0; M_x = 0; M_y = 0; M_z = 0;	yes	86

2 Load case/Resulting anchor forces

Load case: Service loads

Anchor reactions [lb]
Tension force: (+Tension, -Compression)

Anchor	Tension force	Shear force	Shear force x	Shear force y
1	982	0	0	0

max. compressive strain: - [‰]
max. compressive stress: - [psi]
resulting tension force in (x/y)=(0.000/0.000): 0 [lb]
resulting compression force in (x/y)=(0.000/0.000): 0 [lb]

Hilti PROFIS Engineering 3.1.1

www.hilti.com

Company:	Respec Engineering	Page:	3
Address:	2700 Gambell Street Suite 500	Specifier:	NIC
Phone I Fax:	|	E-Mail:	nathaniel.cox@respec.com
Design:	Baxter - RM1/2 - Top of Exterior wall - C5 Connection	Date:	10/22/2021
Fastening point:			

3 Tension load (Most utilized anchor 1)

	Load P_s [lb]	Capacity P_t [lb]	Utilization $\beta_P = P_s/P_t$ [%]	Status
Overall strength	982	1,145	86	OK

3.1 Overall strength

$P_{t,Base}$ = ESR Value refer to ICC-ES ESR-4561
$P_t = P_{t,Base} \cdot f_{red,E} \cdot f_{red,s} \cdot f_{red,Temp} \cdot f_{red,Bedjoint}$
$P_t \geq P_s$

Variables

c_{min} [in.]	c_{cr} [in.]	s_{min} [in.]	s_{cr} [in.]	Temperature [°F]
4.000	20.000	6.000	19.000	68

Results

P_t [lb]	$P_{t,Base}$ [lb]	P_s [lb]	$f_{red,E}$	$f_{red,S}$	$f_{red,Temp}$	$f_{red,Bedjoint}$
1,145	1,386	982	0.827	1.000	1.000	1.000

C - 76

Hilti PROFIS Engineering 3.1.1

www.hilti.com

Company:	Respec Engineering	Page:	4
Address:	2700 Gambell Street Suite 500	Specifier:	NIC
Phone I Fax:	|	E-Mail:	nathaniel.cox@respec.com
Design:	Baxter - RM1/2 - Top of Exterior wall - C5 Connection	Date:	10/22/2021
Fastening point:			

4 Shear load (Most utilized anchor 1)

	Load V_s [lb]	Capacity V_t [lb]	Utilization $\beta_V = V_s/V_t$ [%]	Status
Overall strength	N/A	N/A	N/A	N/A

5 Warnings

- The anchor design methods in PROFIS Engineering require rigid anchor plates per current regulations (AS 5216:2018, ETAG 001/Annex C, EOTA TR029 etc.). This means load re-distribution on the anchors due to elastic deformations of the anchor plate are not considered - the anchor plate is assumed to be sufficiently stiff, in order not to be deformed when subjected to the design loading. PROFIS Engineering calculates the minimum required anchor plate thickness with CBFEM to limit the stress of the anchor plate based on the assumptions explained above. The proof if the rigid anchor plate assumption is valid is not carried out by PROFIS Engineering. Input data and results must be checked for agreement with the existing conditions and for plausibility!
- Refer to the manufacturer's product literature for cleaning and installation instructions.
- For additional information about ACI 318 strength design provisions, please go to https://submittals.us.hilti.com/PROFISAnchorDesignGuide/
- The min. sizes of the bricks, the masonry compressive strength, the type / strength of the mortar and the grout (in case of fully grouted CMU walls) has to fulfill the requirements given in the relevant ESR-approval or in the PTG.
- Only the local load transfer from the anchor(s) to the wall is considered, a further load transfer in the wall is not covered by PROFIS!
- Wall is assumed as being perfectly aligned vertically – checking required(!): Noncompliance can lead to significantly different distribution of forces and higher tension loads than those calculated by PROFIS. Masonry wall must not have any damages (neither visible nor not visible)! While installation, the positioning of the anchors needs to be maintained as in the design phase i.e. either relative to the brick or relative to the mortar joints.
- The effect of the joints on the compressive stress distribution on the plate / bricks was not taken into consideration.
- If no significant resistance is felt over the entire depth of the hole when drilling (e.g. in unfilled butt joints), the anchor should not be set at this position or the area should be assessed and reinforced. Hilti recommends the anchoring in masonry always with sieve sleeve. Anchors can only be installed without sieve sleeves in solid bricks when it is guaranteed that it has not any hole or void.
- The accessories and installation remarks listed on this report are for the information of the user only. In any case, the instructions for use provided with the product have to be followed to ensure a proper installation.
- The compliance with current standards (e.g. 2015, 2012, 2009 and 2006 IBC) is the responsibility of the user.
- Drilling method (hammer, rotary) to be in accordance with the approval!
- Masonry needs to be built in a regular way in accordance with state-of the art guidelines!
- Warnings/Notes - OST in Masonry HNA!

Fastening meets the design criteria!

C - 77

Hilti PROFIS Engineering 3.1.1

www.hilti.com

Company:	Respec Engineering	Page:	5
Address:	2700 Gambell Street Suite 500	Specifier:	NIC
Phone I Fax:	|	E-Mail:	nathaniel.cox@respec.com
Design:	Baxter - RM1/2 - Top of Exterior wall - C5 Connection	Date:	10/22/2021
Fastening point:			

6 Installation data

Anchor type and diameter: Kwik Bolt TZ2 - CS 3/4 (4 3/4)

Profile: -

Item number: 2210311 KB-TZ2 3/4x5 1/2

Hole diameter in the fixture: -

Maximum installation torque: 602 in.lb

Plate thickness (input): -

Hole diameter in the base material: 0.750 in.

Hole depth in the base material: 5.750 in.

Drilling method: Drilled in hammer mode

Minimum thickness of the base material: 7.625 in.

Hilti KB-TZ2 stud anchor with 4.75 in embedment, 3/4 (4 3/4), Steel galvanized, installation per ESR-4561

Coordinates Anchor in.

Anchor	x	y	c_{-x}	c_{+x}	c_{-y}	c_{+y}
1	0.000	0.000	18.000	18.000	20.000	8.000

Hilti PROFIS Engineering 3.1.1

www.hilti.com

Company:	Respec Engineering	Page:	6
Address:	2700 Gambell Street Suite 500	Specifier:	NIC
Phone I Fax:	|	E-Mail:	nathaniel.cox@respec.com
Design:	Baxter - RM1/2 - Top of Exterior wall - C5 Connection	Date:	10/22/2021
Fastening point:			

7 Remarks; Your Cooperation Duties

- Any and all information and data contained in the Software concern solely the use of Hilti products and are based on the principles, formulas and security regulations in accordance with Hilti's technical directions and operating, mounting and assembly instructions, etc., that must be strictly complied with by the user. All figures contained therein are average figures, and therefore use-specific tests are to be conducted prior to using the relevant Hilti product. The results of the calculations carried out by means of the Software are based essentially on the data you put in. Therefore, you bear the sole responsibility for the absence of errors, the completeness and the relevance of the data to be put in by you. Moreover, you bear sole responsibility for having the results of the calculation checked and cleared by an expert, particularly with regard to compliance with applicable norms and permits, prior to using them for your specific facility. The Software serves only as an aid to interpret norms and permits without any guarantee as to the absence of errors, the correctness and the relevance of the results or suitability for a specific application.
- You must take all necessary and reasonable steps to prevent or limit damage caused by the Software. In particular, you must arrange for the regular backup of programs and data and, if applicable, carry out the updates of the Software offered by Hilti on a regular basis. If you do not use the AutoUpdate function of the Software, you must ensure that you are using the current and thus up-to-date version of the Software in each case by carrying out manual updates via the Hilti Website. Hilti will not be liable for consequences, such as the recovery of lost or damaged data or programs, arising from a culpable breach of duty by you.

Wall Anchorage & Continuous Tie Design - Summary

20 gage PLB™-36 Grade 50 with 5' - 4" Deck Span

VERCO DECKING, INC. — NUCOR

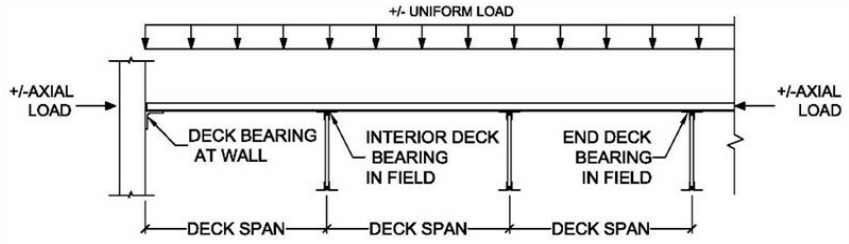
Project: ASD Tier 1 — Job No. ASD Tier 1
Description: Baxter Elementary — Engineer: ASD Tier 1

Connections to Support (Ledger/Chord) at WALL	*Connections in FIELD of Diaphragm*
3/4" Visible Dia. Arc Spot Weld	3/4" Visible Dia. Arc Spot Weld
36 / 7 Perpendicular Connection Pattern	36 / 7 Perpendicular Connection Pattern
1.125 in Steel Deck Minimum End Distance	1.125 in Steel Deck Minimum End Distance
Note: Support welds at interlocking sidelaps may be 3/8" x 1 1/4" arc seam welds in lieu of arc spot welds.	
A36 Support Member or Equivalent	A36 Support Member or Equivalent
0.25 in ≤ Support Thickness in	0.125 in ≤ Support Thickness in
0.94 in Support Member Minimum Edge Distance	0.94 in Support Member Minimum Edge Distance
3.00 in Steel Deck Bearing on Support at Wall	5.00 in Steel Deck Bearing on Supports in Field of Diaphragm
	2.00 in Steel Deck Sheet End Bearing on Support in the Field
0.01in Connection Prying Action for Seismic at Wall	2.25 in Minimum Steel Deck End Lap Length
0.00 in Connection Prying Action for Wind at Wall	

Summary of Calculations in accordance with ASCE 7-16, AISI S100-16, and ER-2018

1-Span	Steel Deck Axial and Bending Check	0.28	≤1.0 Pass		
	Connection Strength Check	0.25	≤1.0 Pass at wall	0.25	≤1.0 Pass in field
	Web Crippling Check	0.08	≤1.0 Pass at wall	0.09	≤1.0 Pass in field
2-Span	Steel Deck Axial and Bending Check	0.27	≤1.0 Pass		
	Connection Strength Check	0.25	≤1.0 Pass at wall	0.25	≤1.0 Pass in field
	Web Crippling Check	0.06	≤1.0 Pass at wall	0.13	≤1.0 Pass in field
3-Span	Steel Deck Axial and Bending Check	0.21	≤1.0 Pass		
	Connection Strength Check	0.19	≤1.0 Pass at wall	0.25	≤1.0 Pass in field
	Web Crippling Check	0.06	≤1.0 Pass at wall	0.11	≤1.0 Pass in field

Vertical Loads		*Horizontal Loads and Factors*	
Dead Load for Inward Wind Combo, D_i (psf)	2.3	Wall Inward Wind Anchorage Load, W_i (plf)	0
Dead Load for Wind Uplift Combo, D_o (psf)	2.3	Wall Outward Wind Anchorage Load, W_o (plf)	0
Live Load, L (psf)	0.0	Notional Load for Wall Anchorage, ±N (plf)	0
Roof Live Load, L_r (psf)	0.0	Seismic Wall Anchorage Load, ±F (plf)	740
Rain Load, R (psf)	0.0	Seismic Parameter, SDS	1.54
Snow Load, S (psf)	40.0	Seismic Design Category	C, D, E or
Inward Wind, W_i (psf)	0.0	Wall Construction	Concrete or Masonry
Wind Uplift on Steel Deck , W_o (psf)	0.0	Steel Element of Structural Wall Anchorage System Increase (ASCE 7 Section 12.11.2.2.2)	1.4
Wind Uplift for Connections, W_o (psf)	0.0		



Wall Anchorage & Continuous Tie Web Tool Version 1.0 — Date: 10/22/2021

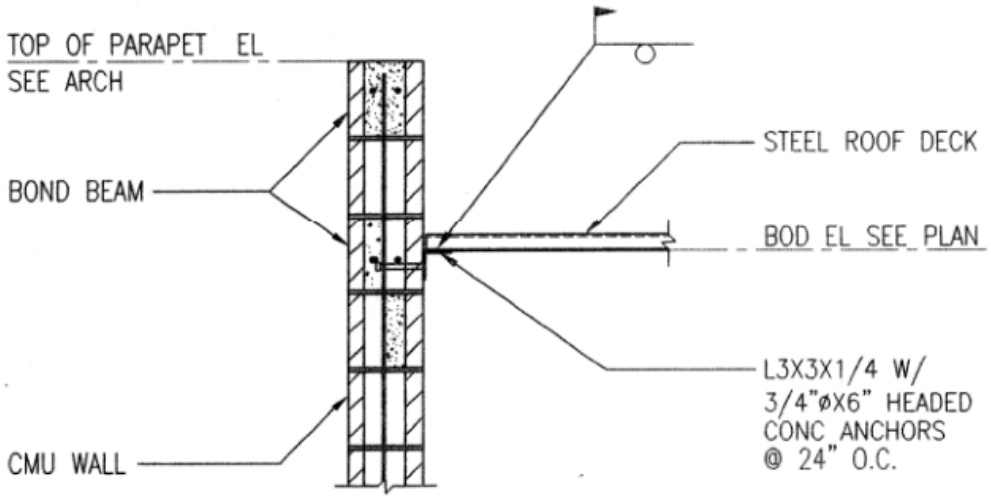
C - 80

ASD Tier 1 Inspections: Baxter Elementary 21156AN	Respec 2700 Gambell St. Suite 500 Anchorage, AK 99503 T: (907) 743-3200	Designed By: Nathaniel I. Cox Date: 10/25/2021

ASCE 41-17 Quick-Checks:

CMU Diaphgram to Shearwall Connection Capacity

Typical 1999 Connection



1 ROOF DECK TO CMU WALL
SCALE: 3/4" = 1'-0"

1999 Record Drawings - 1/S4.1

1/8

PDC INC. ENGINEERS

C - 81

ASD Tier 1 Inspections: Baxter Elementary 21156AN	Respec 2700 Gambell St. Suite 500 Anchorage, AK 99503 T: (907) 743-3200	Designed By: Nathaniel I. Cox Date: 10/25/2021

Connection Strengths and Geometry

Masonry

$f'_m := 1500psi$ — *Record Drawings, 1999 S0.1*

Anchors

$f_y := 36ksi$ — Anchor bolt yield strength
A307, S0.1

$l_b := 6in$ — Length of embedment

$l_e := 12in$ — Edge distance of anchor
Assumed

$d_b := \frac{3}{4}in$ — Diameter of anchor

$n_b := 1$ — Number of anchors

$s_b := 24in$ — Anchor spacing within connection

$n_t := 10$ — Number of threads per inch
Course threaded, assumed

$A_b := \frac{\pi}{4} \cdot \left(d_b - \frac{0.9743in}{n_t} \right)^2 = 0.33 \cdot in^2$ — Cross-sectional area of anchor

ASD Tier 1 Inspections: Baxter Elementary 21156AN	Respec 2700 Gambell St. Suite 500 Anchorage, AK 99503 T: (907) 743-3200	Designed By: Nathaniel I. Cox Date: 10/25/2021

Anchor Projected Areas

Tension

$A_{pt} := \pi \cdot l_b^2 = 113.1 \cdot in^2$ — Projected tension area of a single anchor

$\theta := \operatorname{acos}\left(\frac{s_b}{2 \cdot l_b}\right) = 75.46i \cdot deg$

$A_o := \begin{cases} l_b^2 \cdot \left[\pi \cdot \frac{(2 \cdot \theta)}{180deg} - \sin(2 \cdot \theta)\right] & \text{if } n_b > 1 \\ 0 & \text{otherwise} \end{cases}$

$A_o = 0 \cdot in^2$ — Area of overtapping tension zones

$A'_{pt} := \begin{cases} A_{pt} & \text{if } n_b = 1 \\ n_b \cdot A_{pt} & \text{if } s_b \geq 2 \cdot l_b \\ n_b \cdot A_{pt} - (n_b - 1) \cdot A_o & \text{otherwise} \end{cases} = 113.1 \cdot in^2$ — Projected tension area of anchor group

Shear

$l_{be} := \min(l_e, l_b) = 6 \cdot in$

$A_{pv} := \pi \cdot \frac{l_{be}^2}{2}$ — Projected shear area of a single anchor

$\theta := \operatorname{acos}\left(\frac{s_b}{2 \cdot l_{be}}\right) = 75.46i \cdot deg$

$A_o := \begin{cases} l_b^2 \cdot \left[\pi \cdot \frac{(2 \cdot \theta)}{180deg} - \sin(2 \cdot \theta)\right] & \text{if } n_b > 1 \\ 0 \end{cases}$ — Area of overtapping shear zones

$A_o = 0$

$A'_{pv} := \begin{cases} A_{pv} & \text{if } n_b = 1 \\ n_b \cdot A_{pv} & \text{if } s_b \geq 2 \cdot l_{be} \\ n_b \cdot A_{pv} - (n_b - 1) \cdot A_o & \text{otherwise} \end{cases} = 56.55 \cdot in^2$ — Projected shear area of anchor group

PDC INC. ENGINEERS

C - 83

ASD Tier 1 Inspections: Baxter Elementary 21156AN	Respec 2700 Gambell St. Suite 500 Anchorage, AK 99503 T: (907) 743-3200	Designed By: Nathaniel I. Cox Date: 10/25/2021

Anchorage Capacity

Masonry Shear Breakout

$$\phi B_{vnb} := 0.5 \cdot 4 \cdot A'_{pv} \cdot \sqrt{f'_m \cdot \frac{1}{psi}} \cdot psi = 4.38 \cdot kip$$

TMS 402-16 (Equation 9-6)

Masonry Shear Crushing

$$\phi B_{vnc} := 0.5 \cdot 1750 \cdot \left(f'_m \cdot A_b\right)^{\frac{1}{4}} \cdot lbf^{\frac{3}{4}} = 4.14 \cdot kip$$

TMS 402-16 (Equation 9-7)

Anchor Shear Pryout

$$\phi B_{vnpry} := 0.5 \cdot 8 \cdot A'_{pt} \cdot \sqrt{f'_m \cdot \frac{1}{psi}} \cdot psi = 17.52 \cdot kip$$

TMS 402-16 (Equation 9-7)

Anchor Shear Yielding

$$\phi B_{vns} := n_b \cdot 0.9 \cdot 0.6 \cdot A_b \cdot f_y = 6.5 \cdot kip$$

TMS 402-16 (Equation 9-8)

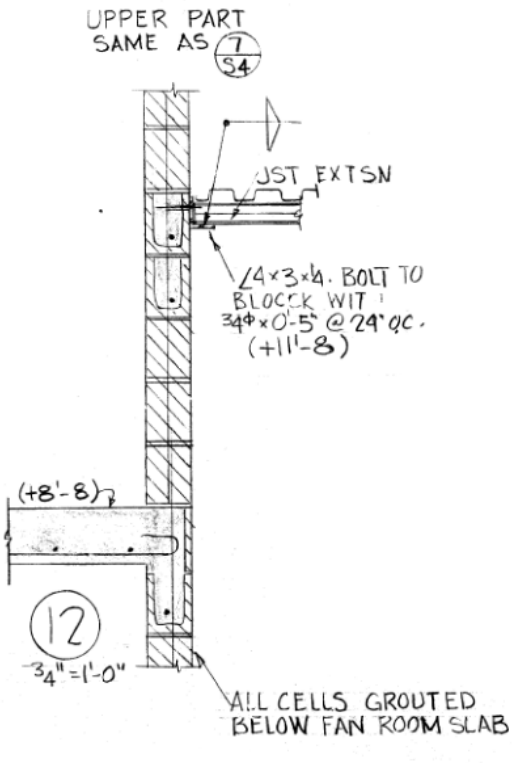
Limiting Capacity Per Anchor Group

$$\phi B_{nv} := \frac{\min\left(\phi B_{vnb}, \phi B_{vnc}, \phi B_{vnpry}, \phi B_{vns}\right)}{24in} = 2070.56 \cdot plf$$

C - 84

ASD Tier 1 Inspections: Baxter Elementary 21156AN	Respec 2700 Gambell St. Suite 500 Anchorage, AK 99503 T: (907) 743-3200	Designed By: Nathaniel I. Cox Date: 10/25/2021

Minimum 1973 Connection



1973 Record Drawings - 12/S4

5/8

PDC INC. ENGINEERS

ASD Tier 1 Inspections: Baxter Elementary 21156AN	Respec 2700 Gambell St. Suite 500 Anchorage, AK 99503 T: (907) 743-3200	Designed By: Nathaniel I. Cox Date: 10/25/2021

Connection Strengths and Geometry

Masonry

$f'_m := 1500psi$ — *Assumed. No masonry strength observed.*

Anchors

$f_y := 36ksi$ — Anchor bolt yield strength
A307, assumed

$l_b := 5in$ — Length of embedment

$l_e := 12in$ — Edge distance of anchor
Assumed

$d_b := \frac{3}{4}in$ — Diameter of anchor

$n_b := 1$ — Number of anchors

$s_b := 24in$ — Anchor spacing within connection

$n_t := 10$ — Number of threads per inch
Course threaded, assumed

$A_b := \frac{\pi}{4} \cdot \left(d_b - \frac{0.9743in}{n_t} \right)^2 = 0.33 \cdot in^2$ — Cross-sectional area of anchor

PDC INC. ENGINEERS

ASD Tier 1 Inspections: Baxter Elementary 21156AN	Respec 2700 Gambell St. Suite 500 Anchorage, AK 99503 T: (907) 743-3200	Designed By: Nathaniel I. Cox Date: 10/25/2021

Anchor Projected Areas

Tension

$A_{pt} := \pi \cdot l_b^2 = 78.54 \cdot in^2$

Projected tension area of a single anchor

$\theta := \operatorname{acos}\left(\frac{s_b}{2 \cdot l_b}\right) = 87.21i \cdot deg$

$$A_o := \begin{cases} l_b^2 \cdot \left[\pi \cdot \frac{(2 \cdot \theta)}{180deg} - \sin(2 \cdot \theta)\right] & \text{if } n_b > 1 \\ 0 & \text{otherwise} \end{cases}$$

$A_o = 0 \cdot in^2$

Area of overtapping tension zones

$$A'_{pt} := \begin{cases} A_{pt} & \text{if } n_b = 1 \\ n_b \cdot A_{pt} & \text{if } s_b \geq 2 \cdot l_b \\ n_b \cdot A_{pt} - (n_b - 1) \cdot A_o & \text{otherwise} \end{cases} = 78.54 \cdot in^2$$

Projected tension area of anchor group

Shear

$l_{be} := \min(l_e, l_b) = 5 \cdot in$

$A_{pv} := \pi \cdot \frac{l_{be}^2}{2}$

Projected shear area of a single anchor

$\theta := \operatorname{acos}\left(\frac{s_b}{2 \cdot l_{be}}\right) = 87.21i \cdot deg$

$$A_o := \begin{cases} l_b^2 \cdot \left[\pi \cdot \frac{(2 \cdot \theta)}{180deg} - \sin(2 \cdot \theta)\right] & \text{if } n_b > 1 \\ 0 \end{cases}$$

Area of overtapping shear zones

$A_o = 0$

$$A'_{pv} := \begin{cases} A_{pv} & \text{if } n_b = 1 \\ n_b \cdot A_{pv} & \text{if } s_b \geq 2 \cdot l_{be} \\ n_b \cdot A_{pv} - (n_b - 1) \cdot A_o & \text{otherwise} \end{cases} = 39.27 \cdot in^2$$

Projected shear area of anchor group

PDC INC. ENGINEERS

C - 87

ASD Tier 1 Inspections: Baxter Elementary 21156AN	Respec 2700 Gambell St. Suite 500 Anchorage, AK 99503 T: (907) 743-3200	Designed By: Nathaniel I. Cox Date: 10/25/2021

Anchorage Capacity

Masonry Shear Breakout

$$\phi B_{vnb} := 0.5 \cdot 4 \cdot A'_{pv} \cdot \sqrt{f'_m \cdot \frac{1}{psi}} \cdot psi = 3.04 \cdot kip$$

TMS 402-16 (Equation 9-6)

Masonry Shear Crushing

$$\phi B_{vnc} := 0.5 \cdot 1750 \cdot \left(f'_m \cdot A_b \right)^{\frac{1}{4}} \cdot lbf^{\frac{3}{4}} = 4.14 \cdot kip$$

TMS 402-16 (Equation 9-7)

Anchor Shear Pryout

$$\phi B_{vnpry} := 0.5 \cdot 8 \cdot A'_{pt} \cdot \sqrt{f'_m \cdot \frac{1}{psi}} \cdot psi = 12.17 \cdot kip$$

TMS 402-16 (Equation 9-7)

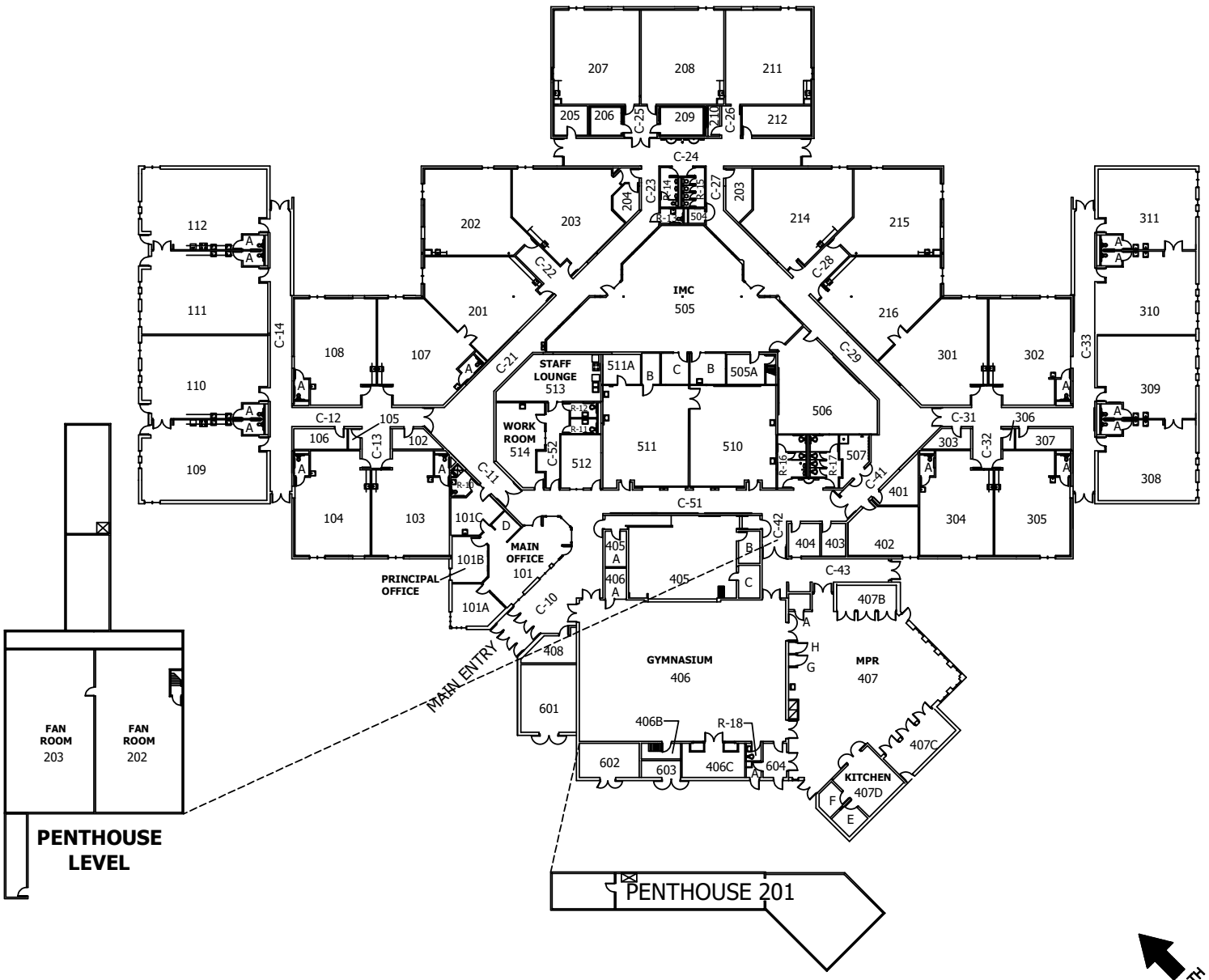
Anchor Shear Yielding

$$\phi B_{vns} := n_b \cdot 0.9 \cdot 0.6 \cdot A_b \cdot f_y = 6.5 \cdot kip$$

TMS 402-16 (Equation 9-8)

Limiting Capacity Per Anchor Group

$$\phi B_{nv} := \frac{\min\left(\phi B_{vnb}, \phi B_{vnc}, \phi B_{vnpry}, \phi B_{vns} \right)}{24in} = 1520.92 \cdot plf$$



BAXTER ELEMENTARY

ANCHORAGE SCHOOL DISTRICT

BAXTER ELEMENTARY SCHOOL
2991 BAXTER ROAD
ANCHORAGE, ALASKA 99504

FLOOR PLAN

DRAWN:
CHECKED:
DATE: 06/21/16
REVISIONS: 05/03/17

SCALE: NTS

SHEET NO.
1 OF 1

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.