LOGAN CITY SCHOOL DISTRICT FACILITIES ASSESSMENT

Reporting Standards for Existing Conditions

See the attached spreadsheet for ratings for all Logan City School District Facilities.

OVERALL BUILDING RATING - (SHOWN ON THE FAR RIGHT.)

A. Good - Building should adequately serve current and future needs and use for the 10 years or more with minor repairs and routine maintenance.

B. Fair - Building should adequately serve current and future needs with some upgrades and repairs (i.e. re-roof or replace carpet, ADA or Code upgrade or some equipment replacement) within the next ten years and routine maintenance and repairs.

C. Poor - There are several elements that would require major renovation or replacement in the next 5 to 10 years (i.e. combinations several systems such as; re-roof, seismic upgrade, major ADA and/or Code upgrades, HVAC replacement.)

D. Very Poor - There are many items that do not meet Codes and Standards and needed repairs and systems improvements make the facility a candidate for either a major building renovation or possible replacement.

Building summaries for each building will be provided that indicate the overall elements that need major repair, replacement or upgrades.

STRUCTURAL - SEE REPORTING STANDARDS FOLLOWING THIS SECTION

- Group A: Buildings or components that come close to meeting current life safety code requirements. It is expected these buildings will perform reasonably well under the required loadings. Examples of these include buildings that were built to benchmark codes (generally within the last 20 years).

- Group B: Buildings or components that require minor modification to meet life safety code requirements. These structures will likely perform adequately during a substantial loading event (snow, wind, seismic), but have some vulnerabilities that may lead to moderate, localized damage. Examples include reinforced masonry buildings built in the 1970's that may have a few connection inadequacies.

- Group C: Buildings or components that require moderate upgrades to meet life safety code requirements. These structures contain weaknesses that make it prone to significant damage during a substantial loading event. Examples of these buildings include Group D buildings with partial retrofits, and reinforced masonry buildings without adequate connections or many large window openings.

- Group D: Buildings or components that require major renovation to meet life safety code requirements. These structures contain weaknesses that make it prone to severe damage during a substantial loading event. Examples include unreinforced masonry buildings, non-ductile concrete frames, and buildings with missing or weak connections. These inadequacies generally are found in buildings built before 1970.
### General Building Elements

#### Ratings

<table>
<thead>
<tr>
<th>Rating</th>
<th>Description</th>
</tr>
</thead>
<tbody>
<tr>
<td>A = Good</td>
<td>Means that the element adequately meets the acceptable standards and usage and should not require more than routine repair and maintenance for the next 10 years or more.</td>
</tr>
<tr>
<td>B = Fair</td>
<td>Near standards and useful for the next 5 years but may require major repair or replacement in the next 5 to ten years.</td>
</tr>
<tr>
<td>C = Poor</td>
<td>Does not meet standards or needs major repairs, upgrades or replacement in the next 5 to 10 years.</td>
</tr>
<tr>
<td>D = Very Poor</td>
<td>Does not meet acceptable standards and/or Codes, has major operational or functional deficiencies, recommend that replacement, renovation or upgrades be completed on a priority basis when feasible.</td>
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</tbody>
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1. Exterior finishes: (A = Good, B = Fair, C = Poor and D = Very Poor)
2. Windows and doors: (A = Good, B = Fair, C = Poor and D = Very Poor)
3. Roofing: (A = Less than 5 years old and under warranty, B = 5 to 10 years old under warranty, C = 10 years old and under warranty may need repair, D = Over 15 years old out of warranty and in need of replacing in the very near future.)
4. Interior Wall Finishes: (A = Good, B = Fair, C = Poor and D = Very Poor)
5. Ceilings: (A = Good, B = Fair, C = Poor and D = Very Poor)
6. Flooring: (A = Good, B = Fair, C = Poor and D = Very Poor)
7. Millwork: (A = Good, B = Fair, C = Poor and D = Very Poor)
8. Kitchens: (A = Good, B = Fair, C = Poor and D = Very Poor)
9. Multi-Purpose Room: (A = Good, B = Fair, C = Poor and D = Very Poor)
10. Media Center: (A = Good, B = Fair, C = Poor and D = Very Poor)
11. Computer Lab: (A = Good, B = Fair, C = Poor and D = Very Poor)
12. Restrooms: (A = Good, B = Fair, C = Poor and D = Very Poor)
13. Sustainability: (A = Energy efficient low cost operational, B = moderately efficient, C = Non-insulated with high operation cost, D = Poorly insulated with high operational costs and inefficient HVAC System in need of upgrading.)

### ADA and Code Compliance

1. Restrooms Fixtures: (A = Compliant, B = Partial compliance needs some work, C = Non-compliant needs revision to stalls, fixtures and hardware and D = Non-compliant may require remodeling space to provide adequate access and space needs.) Showers (Same)
2. Entries: (A = Compliant, B = Partial compliance minor work, C = Non-compliant moderate rework required and D = Non-compliant major rework required to provide accessibility)
3. Interior Routes, Stairs, Ramps, Clearances: (A = Compliant, B = Partial compliance minor work, C = Non-compliant moderate rework required and D = Non-compliant major rework required to provide accessibility.)
4. Miscellaneous Building Elements/Door Hardware, Handrails, Guardrails, etc.: (A= Compliant, B= Partial Compliance minor work, C= Non-compliant moderate rework required and D= Non-compliant major rework required.)

5. Signage Exit and ADA (A = Compliant, B = Partial compliance, C = Non-Compliant moderate rework required and D = Non-compliant needs upgrade.

Footnotes
In addition, other items reviewed include second floor access and building exiting.

Fire Code: Many buildings are constructed with area/fire separation walls that need to be maintained in proper condition. New laws will require inspection on a yearly basis. It is noted so that the District may plan on inspecting and repairing fire walls. Any School Building that is not fully fire sprinklered will require moderate to major rework to comply.

**Mechanical**

1. Heating: (A = Adequate heating with energy efficient equipment, B = Adequate heating levels, equipment outdated, C = Heating equipment needs upgrade or replacement, D = Complete HVAC upgrade needed and may require changes to building space to provide per District standard.)

2. Cooling: (A = Adequate heating with energy efficient equipment, B = Adequate heating levels, equipment outdated, C = Heating equipment needs upgrade or replacement, D = Complete HVAC upgrade needed and may require changes to building space to provide per District standard.)

3. Air Distribution: (A = Meets acceptable standards, B = System needs minor upgrades or repairs to meet standards, C = System needs moderate upgrades or repairs to meet standards, D = System is non existent or needs to be replaced to meet standards.)

4. Exhaust System: (A = Meets acceptable standards, B = System needs minor upgrades or repairs to meet standards, C = System needs moderate upgrades or repairs to meet standards, D = System is non existent or needs to be replaced to meet standards.)

5. Ventilation: (A = Meets acceptable standards, B = System needs minor upgrades or repairs to meet standards, C = System needs moderate upgrades or repairs to meet standards, D = System is non existent or needs to be replaced to meet standards.)

6. Data/Server Room: (A = Meets acceptable standards, B = System needs minor upgrades or repairs to meet standards, C = System needs moderate upgrades or repairs to meet standards, D = System is non existent or needs to be replaced to meet standards.)

7. Temperature Controls: Miscellaneous equipment fume hoods, compressors saw dust collectors: (A = Meets acceptable standards, B = System needs minor upgrades or repairs to meet standards, C = System needs moderate upgrades or repairs to meet standards, D = System is non existent or needs to be replaced to meet standards.)

8. Seismic: (A = Meets acceptable standards, B = System needs minor upgrades or repairs to meet standards, C = System needs moderate upgrades or repairs to meet standards, D = System is non existent or needs to be replaced to meet standards.)

Footnotes
In addition, kitchen equipment exhaust and special building systems were also reviewed as part of the study.
PLUMBING

1. Piping Systems: (A = Meets acceptable standards, B = System needs minor upgrades or repairs to meet standards, C = System needs moderate upgrades or repairs to meet standards, D = System is non existent or needs to be replaced to meet standards.)

2. Restroom Fixtures/Hardware: (A = Good condition meets Code functions well, B = Reasonable good condition still functional, C = Needs ADA compliance or hardware and D = Non functional, damaged or no accessible route need replacement and/or remodeling.)

3. Roof Drainage System: (A = Meets acceptable standards, B = System needs minor upgrades or repairs to meet standards, C = System needs moderate upgrades or repairs to meet standards, D = System is non existent or needs to be replaced to meet standards.)

4. Water Heating: Domestic kitchen and mechanical water heaters: (A = Meets acceptable standards, B = System needs minor upgrades or repairs to meet standards, C = System needs moderate upgrades or repairs to meet standards, D = System is non existent or needs to be replaced to meet standards.)

5. Natural Gas System: (A = Meets acceptable standards, B = System needs minor upgrades or repairs to meet standards, C = System needs moderate upgrades or repairs to meet standards, D = System is non existent or needs to be replaced to meet standards.)

6. Fire Protection: (A = Meets acceptable standards, B = System needs minor upgrades or repairs to meet standards, C = System needs moderate upgrades or repairs to meet standards and D = System is non existent or needs to be replaced to meet standards.)

7. Special Systems: (A = Meets acceptable standards, B = System needs minor upgrades or repairs to meet standards, C = System needs moderate upgrades or repairs to meet standards, D = System is non existent or needs to be replaced to meet standards.)

8. Code Compliance: (A = Meets acceptable standards, B = System needs minor upgrades or repairs to meet standards, C = System needs moderate upgrades or repairs to meet standards, D = System is non existent or needs to be replaced to meet standards.)

ELECTRICAL

1. Service Equipment: (A = Meets current and near future needs, B = Meets current needs but not able to meet expanded needs, C = Beyond capacity so that provide for desired educational needs and D = Beyond capacity and out of compliance needs service upgrade.)

2. Lighting: (A = Adequate lighting with energy efficient fixtures, B = adequate lighting levels, fixtures outdated, C = Lighting levels exit lights need improvement, D = complete lighting upgrade needed.)

3. Fire Alarms/Smoke Detectors (A = complete alarm system per code, B = Alarm system not per code, C = partial alarm system but areas not covered, D = no alarm system or outdated needing upgrade.)

4. Intercom System: (A = Compliant, B = Partial compliance C = Existing but not compliant or needing repairs and D = Non-existent or in need of complete new system.)

5. Data/Internet/Telephones: (A = System and connection meets acceptable standards, B = System needs minor upgrades, C = System needs major upgrades and D = System non-existent or needs new system and equipment.)

6. Outlets: (A = Outlets are provided to meet current and anticipated needs, B = Most needs are being met needs some minor revision, C = Not enough provided need to install some
more and D = Not enough outlets very difficult to add due to construction or circuiting.)

7. Security System: (A = Meets acceptable standards, B = System need minor upgrades or repairs to meet standards, C = System needs moderate upgrades or repairs to meet standards, D = System is non existent or needs to be replaced to meet standards.)

CIVIL

1. Drives and Drop-offs: (A = Meets acceptable standards, B = Needs minor upgrades or repairs to meet standards, C = Needs moderate upgrades or repairs to meet standards, D = Is non existent or needs to be replaced to meet standards.)

2. Accessible Routes: (A = Meets ADA standards, B = Needs minor upgrades or repairs to meet ADA standards, C = Needs moderate upgrades or repairs to meet ADA standards and D = Is non existent or needs to be replaced to meet standards.

3. Parking: Numbers, separation: (A= Meets acceptable standards, B= Needs minor upgrades to meet standards, C= Needs moderate upgrade to meet standards and D= Needs major upgrades to meet standards)

4. Safety: Student / Vehicle Access: (A= Meets acceptable standards, B= Needs minor upgrades to meet standards, C= Needs moderate upgrade to meet standards and D= Needs major upgrades to meet standards)

5. Fencing: (A = Provided, B = Needs minor repairs, C= Needs moderate repair or partial replacement, and D = Not provided and needs installed.)

6. Landscape: (A = Meets District standards, B = System need minor upgrades or repairs to meet standards, C = System needs moderate upgrades or repairs to meet standards, D = System is non existent or needs to be replaced to meet standards.)
INTRODUCTION

This report summarizes Dunn Associates Inc. findings of the structural condition of the Logan School District buildings. The district desired to know the structural condition, specifically related to seismic considerations, as an input to their overall master plan.

The first part of this report outlines Dunn Associates Inc. methodology for the study and our general observations and recommendations. The second part provides a building specific report on each school. These reports contain a summary of the building construction and deficiencies and a list of structural inadequacies and recommended rehabilitation measures and the areas affected. These should form the basis for making decisions about the structural condition of the buildings.

EVALUATION METHODOLOGY

This study consisted of three parts; review of existing plans, site visit to observe the existing conditions and gather information not available in the plans, and evaluation. Because of the nature of this study (master plan), an in-depth, calculation based structural evaluation was not performed.

Gravity load resisting elements (columns, beams, bearing walls) were reviewed in the drawings and observed in the field for obvious deterioration or damage. Generally, gravity inadequacies manifest themselves during construction or at some point during the life of the structures because these loads are either continuous or frequent.

Seismic load resisting elements (shear walls, frames, diaphragms) were also reviewed and observed in the field. To determine if there are inadequate seismic force resisting elements, we used a modified checklist from ASCE 37 Seismic Evaluation of Existing Buildings, the age of construction, and engineering judgment. From these sources, we determined what building elements and/or characteristics were inadequate and required some structural rehabilitation.

Each gravity or lateral inadequacy is identified in the building specific report along with recommended rehabilitation methods. As specific projects are planned, the deficiencies should be validated and additional rehabilitation options evaluated with ASCE 41 Seismic Rehabilitation of Existing Buildings.

GENERAL OBSERVATIONS

The primary construction types throughout the district are unreinforced masonry (URM), concrete frames, and reinforced masonry. Generally, the roofs of these structures are framed with open web steel joists that bear either on beams or walls. These joists support metal roof deck, which in turn supports the roofing and environmental loads.

The gravity load inadequacies in the district are fairly limited and outlined in each specific building report.

Common, high-risk, seismic vulnerabilities are identified in the following table. These are representative of buildings in the district. See the specific building report for inadequacies specific to each school.
**GROUPING METHODOLOGY**

In an effort to assist the district in prioritizing structural remediation work, we have grouped the buildings into four categories; identified as A-D. It is important to note, that all remediation work identified is required to bring a building to the point that it meets the current life safety building code. However, the groupings are intended to call attention to the most severe deficiencies, so they can be mitigated first. The groupings are as follows:

**Group A:** Buildings or components that come close to meeting current life safety code requirements. It is expected these buildings will perform reasonably well under the required loadings. Examples of these include buildings that were built to benchmark codes (generally within the last 20 years).

**Group B:** Buildings or components that require minor modification to meet life safety code requirements. These structures will likely perform adequately during a substantial loading event (snow, wind, seismic), but have some vulnerabilities that may lead to moderate, localized damage. Examples include reinforced masonry buildings built in the 1970’s that may have a few connection inadequacies.

**Group C:** Buildings or components that require moderate upgrades to meet life safety code requirements. These structures contain weaknesses that make it prone to significant damage during a substantial loading event. Examples of these buildings include Group D buildings with partial retrofits, and reinforced masonry buildings without adequate connections or many large window openings.

**Group D:** Buildings or components that require major renovation to meet life safety code requirements. These structures contain weaknesses that make it prone to severe damage during a substantial loading event. Examples include unreinforced masonry buildings, non-ductile concrete frames, and buildings with missing or weak connections. These inadequacies generally are found in buildings built before 1970.

Under seismic loading, it is likely that deficiencies in Group C or D will lead to significant injury or loss of life of a substantial occupancy population. It is also possible that Group B inadequacies will lead to injury, and possibly loss of life; but of a smaller population.

For buildings with multiple additions or structures, the ranking identified reflects the worst case condition. See the individual building report for further information regarding the extents of a given inadequacy.
INCREMENTAL SEISMIC REHABILITATION

Due to the cost and interruption of seismic rehabilitation, coupled with the infrequent nature of earthquakes, many institutions and business in Utah have opted to not pursue seismic risk reduction programs. Given the seismicity in many parts of the state, this decision, either intentional or un-intentional, leaves many structures vulnerable to major damage; which will likely result in many injuries, loss of life, and economic loss.

In order to address the challenge of cost and operational interruption caused by seismic rehabilitation work, the Federal Emergency Management Agency (FEMA) has developed an Incremental Seismic Rehabilitation (ISR) method. It is a mitigation approach that can be implemented over time and coordinated with other major building renovation work. The building codes permit this approach, as long as it does not make the building less safe than it already may be.

ISR is done by timing capital improvement projects with seismic upgrades. For example, when roofing is replaced, strengthening of the sheathing and connections can be done at the same time. When interior walls are reconfigured or replaced, shear walls and connections can be added. This method is particularly efficient because approximately half of seismic rehabilitation costs come from replacing non-structural elements that are removed or damaged during construction.

ISR projects are best accomplished thorough planning for all stages of the project. This is aided by dividing the building into three types of areas: exterior walls, interior walls, and roof. These areas can be further subdivided into major building areas, such as classrooms, gyms, etc... to correspond with scheduled major renovation.

In addition to an experienced design team, the following FEMA references are very helpful in understanding and planning ISR.

FEMA P-420: Engineering Guidelines for Incremental Seismic Rehabilitation
FEMA 395: Incremental Seismic Rehabilitation of School Buildings (K-12)

The temptation exists to use incremental rehabilitation as an excuse to not fully upgrade high and moderate risk buildings in a timely manner. Some owners say, "as long as I am doing something, I am OK". Common sense tells us that stretching seismic rehabilitation efforts over great lengths of time is not prudent. This is because waiting for a long period increases the time of exposure to seismic risk and reduces the period over which one can see a return on the investment. FEMA recommends completing incremental seismic rehabilitation within a 20 year period.

SUMMARY

This report outlines the structural vulnerabilities of the buildings in the Logan School district. This study was based on review of the drawings, site visits, and engineering judgment. Individual building reports summarize, on a per-building basis, the inadequacies, recommended rehabilitation measures, and areas affected.

A number of buildings exist in the district that are at high risk to damage from a seismic event (Group C or Group D). Occupants of these buildings during a seismic event are at risk of injury or loss of life. We strongly recommend that capital budget priority be given to the rehabilitation or replacement of buildings identified as Group C or D. While these buildings are "grandfathered in" for occupancy, they do not meet today's life safety standard.

We strongly encourage the board to implement a seismic mitigation policy that all major renovation projects or additions include seismic mitigation to the current code level. This will help ensure that