**Seismic Project Identification Report**

**REPORT NO. SPIR-****XX-XX**

**for**

**BLOCK #****XX-X (****BLOCK NAME)**

**SCHOOL NAME**

**School Address**

**Facility No:** **xxxxxxx**

**School District No.** **XX****Name of School District**

**Structural Engineering Guidelines for the  
Performance-based Seismic Assessment and Retrofit of  
Low-rise British Columbia School**

**Prepared by** **Consultant Dated** **XXXXXXX**

The Seismic Project Identification Report (SPIR) is a specific report format that documents the seismic retrofit concepts proposed for a seismically deficient school block.

The Ministry of Education (EDUC) requires that SPIRs be used to capture scope, schedule and budget for each high-risk block of a school. Budgets are Class C cost estimates completed by an experienced and qualified Quantity Surveyor (QS).

When completed, SPIR/s form the basis of seismic Project Definition Reports (PDR’s) which present options and a recommendation for the seismic mitigation of the complete facility. The PDR ultimately defines the scope, schedule, budget and risks for the seismic mitigation project, and are used to request funding approval from EDUC.

The SPIR is to be used in conjunction with the SPIR Guidelines document. The expectation is the SPIR will provide the most cost-effective solution for upgrading the block in accordance with the latest edition of the Seismic Retrofit Guidelines in a safe manner.

The SPIR is to be developed with ongoing communications and input from a Technical Review Board (TRB) peer reviewer. TRB technical reviewers are highly experienced engineers that must be involved from initiating the SPIR through to the completion of the SPIR. EDUC requires that each completed SPIR be accompanied by a TRB Technical Review sign-off document, and a TRB QS Review sign-off document.

Typically, SPIRs document the upgrade for blocks to a life-safety standard.

SPIRs for gymnasiums, or at times auditoriums or other large spaces capable of accommodating large numbers of people, should be developed to provide concepts and budgets for both life-safety upgrades, as well as enhanced level upgrades. The intent is to increase the probability these spaces will be available for post-event shelter.

The SPIR template and Guidelines are updated from time to time to reflect changes in practice, guidelines and code. Ongoing feedback from engineering practitioners is an essential part of the updating process.

If at any time there are questions regarding SPIR process or details, please forward your questions or concerns to the TRB Manager, Phillip Chambers ([phillipchambersconsulting@shaw.ca](mailto:phillipchambersconsulting@shaw.ca); or call 250‑216-8906.

| No. | Technical Topic | Summary |  |  |
| --- | --- | --- | --- | --- |
| 1 | School Name and School District | * School Name * School District Name |
| 2 | Block No. / Name | * Xx-X (Block Number) * Block Name |
| 3 | Floor Area | * Xxm2 |
| 4 | Year, Number of Storeys and Type/s of Construction |  |
| 5 | Vs30/Site Classification |  | (Structural Engineer  Professional Seal and Signature) |
| 6 | Liquefaction Potential |  |  |
| 7 | Seismic Retrofit Guidelines Version | * SRG2020 |  |
| 8 | Risk (H1/H2/H3/M/L) |  |  |
| 9 | Probable Event Ranking  (for H1 Blocks Only) |  |  |
| 10 | Life Safety Retrofit Features |  |  |
| 12 | Enhanced Retrofit Features |  |  |
| 13 | Schedule (months) |  |  |
| 14 | Construction Risks |  | Date |
| 15 | Cost Estimates (See appendix C) | * $’s (Cost) * $’s/m2 |
| 16 | PDR Requirements |  |

| **CHAPTER Section Title Page** | |
| --- | --- |
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**Figure 1.1: Elevation – Wing**

**Figure 1.2: Elevation – Wing**

**Figure 2.1: Key Plan for**

|  |  |
| --- | --- |
| **Identification of Retrofit Block (Box #2-1)** | |
|  | |
| **Adjacency (Box #2-2)** | |
|  | No Significant Adjacency Issues |
|  | Significant Adjacency Issues |
| **Adjacency Comments (Box #2-3)** | |
|  | |

|  |  |  |  |  |  |  |  |  |
| --- | --- | --- | --- | --- | --- | --- | --- | --- |
| **School District & School (Box #3-1)** | | | |  | | **Block Name (Box #3-2)** | | |
| School District Name  School Name | | | |  | | Block Name | | |
| **Structural Firm (Box #3-3)** | | | |  | | **Engineer-of-Record (Box #3-4)** | | |
| Click here to enter text. | | | |  | |  | | |
| **Year/s of Construction (Box #3-5)** | | | |  | | **Floor Area (Box #3-6)** | | |
|  | | | |  |  |  |  | |
| **Construction Type/s (Box #3-7)** | | | |  | | **Vs30/Site Classification (Box #3-8)** | | |
|  | | | |  |  |  | |  |
| **Comments on Construction Type (Box #3-9)** | | | | | | | | |
|  | | | | | | | | |
| **Number of Storeys (Box #3-10)** | | | | | | **Clear Storey Heights (Box #3-11)** | | |
|  | | |  | | |  | | |
| **Previous Seismic Upgrade (Box #3-12)** | | | | | | | | |
|  | No |
|  | Yes |
| **Previous Seismic Upgrade Details (Box #3-13)** | | | | | | | | |
|  | | | | | | | | |

|  |
| --- |
| **List of Testing Reports (Box #3-14)** |
|  |

**(1) Vertical Load-bearing Supports (VLS)**

|  |  |  |
| --- | --- | --- |
| **VLS Type (Box #4-1)** |  |  |
|  |  |  |
| **VLS CDL (Box #4-2)** |  |  |
|  |  |  |
| **Supports Description (Box #4-3)** | | |
|  | | |

**(2) Governing Seismic Risk Assessment (SRA) Prototype**

|  |  |  |  |  |  |
| --- | --- | --- | --- | --- | --- |
| **Out-of-Plane Prototype Details (Box #4-4)** | | | | | |
| **Deficiency No.** | **Prototype No.** | **Prototype Description** | **Max. Height** | **Wall Thickness** | **Surcharge** |
|  |  |  |  |  |  |
| **Comments on Out-of-Plane Prototypes (Box #4-5)** | | | | | |
|  | | | | | |

|  |  |  |  |  |  |
| --- | --- | --- | --- | --- | --- |
| **LDRS Prototype Details (Box #4-6)** | | | | | |
| **Deficiency No.** | **Shaking Direction** | **Prototype No.** | **LDRS Prototype Description** | **Max CDL** | **Capacity** |
|  |  |  |  |  |  |
| **Comments on LDRS Prototypes (Box #4-7)** | | | | | |
|  | | | | | |

|  |  |  |  |  |  |  |  |
| --- | --- | --- | --- | --- | --- | --- | --- |
| **(3) Secondary LDRSs** | | | | | | | |
| **Number of LDRS Prototypes (Box #4-8)** | | | | | | | |
|  |  |  |  |  | |  | |
| **LDRS Prototype Details (Box #4-9)** | | | | | | | |
| **Deficiency No.** | **Shaking Direction** | **Prototype No.** | **LDRS Prototype Description** | | **Max CDL** | | **Capacity** |
|  |  |  |  | |  | |  |
| **Comments on LDRS Prototypes (Box #4-10)** | | | | | | | |
|  | | | | | | | |

**(4) Out-of-Plane URM Walls**

|  |  |  |  |  |  |  |  |
| --- | --- | --- | --- | --- | --- | --- | --- |
| **URM Walls (Box #4-11)** | | | | | | | |
|  | No |  |
|  | Yes |  |
|  | **Out-of-Plane Prototype Details (Box #4-12)** | | | | | | |
| **Deficiency No.** | **Prototype No.** | | | **Prototype Description** | **Max. Height** | **Wall Thickness** | **Surcharge** |
|  |  | | |  |  |  |  |
|  | **Comments on Out-of-Plane Prototypes (Box #4-13)** | | | | | | |
|  | | | | | | | |

**(5) Roof Diaphragm**

|  |  |  |  |  |  |  |  |  |  |
| --- | --- | --- | --- | --- | --- | --- | --- | --- | --- |
| **Roof Diaphragm Material (Box #4-14)** | | | | | | | | | |
|  | Wood |  | | Concrete |  |
|  | Steel Deck |  | | Braced Steel |  |
| **Roof Diaphragm Prototype Details (Box #4-15)** | | | | | | | | | |
| **Deficiency No.** | **Prototype No.** | | **Roof Diaphragm Prototype Description** | | | | **Span** | **Max. Movement** | **Capacity** |
|  |  | |  | | | |  |  |  |
| **Comments on Roof Diaphragm (Box #4-16)** | | | | | | | | | |
|  | | | | | | | | | |

**(6) Floor Diaphragm**

|  |  |  |  |  |  |  |  |  |
| --- | --- | --- | --- | --- | --- | --- | --- | --- |
| **Floor Diaphragm Material (Box #4-17)** | | | | | | | | |
|  | Wood | |  | Concrete |
|  | Steel Deck with Concrete Topping | |  |  |
| **Floor Diaphragm Prototype Details (Box #4-18)** | | | | | | | | |
| **Deficiency No.** | **Prototype No.** | **Floor Diaphragm Prototype Description** | | | | **Span** | **Max. Movement** | **Capacity** |
|  |  |  | | | |  |  |  |
| **Comments on Floor Diaphragm (Box #4-19)** | | | | | | | | |
|  | | | | | | | | |

**(7) Connections**

|  |  |  |  |  |  |
| --- | --- | --- | --- | --- | --- |
| **Connection Risk (Box #4-20)** | | | | | |
| **Connection** | **C/D** | **Non-Brittle** | | **Risk** |
| VLS / Roof Diaphragm |  |  | Yes |  |
|  | No |
| VLS / Floor Diaphragm |  |  | Yes |  |
|  | No |
| Roof Diaphragm / LDRS |  |  | Yes |  |
|  | No |
| Floor Diaphragm / LDRS |  |  | Yes |  |
|  | No |
| LDRS / Foundation |  |  | Yes |  |
|  | No |
| Other (Specify) |  |  | Yes |  |
|  | No |
| **Note**:  (1) Connections do not have an assigned RPR value (Chapter 5)  (2) Connection risk is determined as below:  (a) H (High): brittle connections with C/D < 1.0  (b) M (Medium): brittle connections with 1.0 ≤ C/D < 2.0  non-brittle connections with 0.5 ≤ C/D > 1.0  (c) L (Low): brittle connections with C/D ≥ 2.0  non-brittle connections with C/D ≥ 1.0  (3) In Note (2) above, capacity (C) values are overstrength values. | | | | |
| **Comments on Connections (Box #4-21)** | | | | | | |
|  | | | | | | |

**(8) Liquefaction**

|  |  |  |  |  |
| --- | --- | --- | --- | --- |
| **Liquefaction Potential (Box #4-22)** | | | | |
| Significant Risk of Liquefaction for Hazard Return Period of 2500 Years |  | Yes |  |
|  | No |
| **Liquefaction Movement (Box #4-23)** | | | | |
| Risk of Significant Vertical Differential Movement |  | Yes |  |
|  | No |
| Risk of Punching Failure |  | Yes |  |
|  | No |
| Risk of Significant Horizontal Differential Movement |  | Yes |  |
|  | No |
| **Comments on Risk of Liquefaction (Box #4-24)** | | | | |
|  | | | | |

|  |
| --- |
| **Comments on Risk of Vertical Differential Movement (Box #4-25)** |
|  |

|  |
| --- |
| **Comments on Risk of Punching Failure (Box #4-26)** |
|  |

|  |
| --- |
| **Comments on Risk of Horizontal Differential Movement (Box #4-27)** |
|  |

|  |  |  |  |  |  |  |  |
| --- | --- | --- | --- | --- | --- | --- | --- |
|  | **Risk Assessment Results (Box #5-1)** | | | | | | |
| **Deficiency No.** | **Principal Element** | **Prototype No.** | **Prototype Description** | **PDE** | **RPR(2)** |
|  | LDRS |  |  |  |  |
|  | Diaphragm |  |  |  |  |
|  | Out-of-Plane |  |  |  |  |
| **Maximum PDE / RPR** | | | |  |  |
| **Liquefaction Risk** | | | | |  |
| **Existing Block Retrofit Priority Ranking** | | | | |  |
| **Note:**  (1)RPR – Retrofit Priority Ranking  (2) Liquefaction is not assigned a PDE value. The RPR value is assigned for liquefaction on the following basis:  (a) H (High): significant risk of structural failure due to liquefaction movement  (b) L (Low): no significant risk of structural failure due to liquefaction movement  (3) Maximum assigned RPR for an out-of-plane element is H3 for non load-bearing walls and is not restricted for load-bearing walls.  (4) Diaphragms do not have an assigned RPR value (refer to Guidelines and Commentary). | | | | | |
| **Comments on Seismic Deficiencies, Recommended Testing and Risk Assessment Results (Box #5-2)** | | | | | | |
|  | | | | | | |

|  |
| --- |
| **Comments on probable Event Ranking (for High 1 Blocks only) (Box #5-3)** |
|  |

**Retrofit Options Documented (Box #6.1)**

|  |  |  |
| --- | --- | --- |
| **No.** | **Retrofit Performance Level** | **Chapter** |
|  |  |  |
|  |  |  |
|  |  |  |

**Comments on Unit Rate (Box #6-2)**

|  |
| --- |
|  |

**(1) Retrofit Concept**

|  |  |  |
| --- | --- | --- |
| **Comments on retrofit scope versus listed deficiencies (Box #7-1)** | | |
| **Deficiency No.** | **Retrofit Prototype No.** | **Comments** |
|  |  |  |
|  |  |  |
|  |  |  |
|  |  |  |
|  |  |  |

**Figure 7.1: Typical Section –**

**Figure 7.2: Typical Section –**

|  |  |  |  |  |  |  |  |  |
| --- | --- | --- | --- | --- | --- | --- | --- | --- |
| **Comments on Figure 7.1 and Figure 7.2 (Box #7-2)** | | | | | | | | |
|  | | | | | | | | |
| **(2) Retrofit LDRSs** | | | | | | | | | |
| **Number of Retrofit LDRS Prototypes (Box #7-3)** | | | | | | | | | |
|  |  |  |  | |  | |  | | |
| **Retrofit LDRS Prototype Details (Box #7-4)** | | | | | | | | | |
| **Shaking Direction** | **Prototype No.** | **LDRS Prototype Description** | | **Max PDE** | | **Max CDL** | | **Rm** | |
|  |  |  | |  | |  | |  | |
|  |  |  | |  | |  | |  | |
| **Comments on Retrofit LDRS Prototypes (Box #7-5)** | | | | | | | | | |
|  | | | | | | | | | |

**(3) Liquefaction Retrofit**

|  |
| --- |
| **Comments on Liquefaction (Box #7-6)** |
|  |

**Figure 7.3: Typical Section for Liquefaction Retrofit**

**(4) Reference SPIRs**

**Reference SPIRs (Box 7-7)**

|  |  |  |  |
| --- | --- | --- | --- |
| **Reference SPIR No.** | **Reference SPIR Description** | **Retrofit Cost ($’s/m2)** | **Cost Estimate Year** |
|  |  |  |  |
| **Comments:** | | |  |

**(5) Scope of Retrofit**

**(6) Retrofit Cost Estimate**

**(7) Schedule**

|  |  |
| --- | --- |
| **Schedule (Box #7-8)** | |
| Duration of Construction Period | months |
| **Comments on Operational Disruption:** | |

**(8) Construction Risks**

|  |  |  |  |  |  |  |
| --- | --- | --- | --- | --- | --- | --- |
|  | | | **Risks (Box #7-9)** | | | |
| **Risk Description** | **Significant Risk** | | | | |
| Asbestos |  | Yes | |  | No |
| Vermiculite |  | Yes | |  | No |
| Lead Paint |  | Yes | |  | No |
| Other |  | Yes | |  | No |
| **Risk Management Comments (Box #7-10)** | | | | | | |
|  | | | | | | |

|  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |
| --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- |
| **(1) Retrofit Concept**   |  |  |  | | --- | --- | --- | | **Comments on retrofit scope versus deficiencies (Box #8-1)** | | | | **Deficiency No.** | **Retrofit Prototype No.** | **Comments** | |  |  |  | |  |  |  | |  |  |  | |  |  |  | |  |  |  |   **If an Enhanced Performance Retrofit is applicable insert the same Sections 1 to 8 as listed in the Life Safety Retrofit solution in Chapter 7.0** |

|  |
| --- |
| **Architectural Scope of Work (Box #9-1)** |
|  |

|  |
| --- |
| **Mechanical Engineering Scope of Work (Box #9-2)** |
|  |

|  |
| --- |
| **Electrical Engineering Scope of Work (Box #9-3)** |
|  |

|  |
| --- |
| **Architectural, Mechanical and Electrical Engineering Construction Risks (Box #9-4)** |
|  |

|  |  |  |  |  |
| --- | --- | --- | --- | --- |
| **TRB PDR Requirements (Box #10-1)** | | | | |
| **No.** | **PDR Structural Details** | **Completed** | **Deferred to PDR** | **Not Required** |
| 1 | Update of Geotechnical Investigation |  |  |  |
| 2 | Custom Site Response Analysis |  |  |  |
| 3 | Ambient Vibration Testing |  |  |  |
| 4 | Nondestructive Investigation/Testing |  |  |  |
| 5 | Destructive Investigation/Testing |  |  |  |
| 6 | Update of Hazmat Report |  |  |  |
| 7 | Other |  |  |  |
| **Note**:  PDR Requirements are agreed to by both the Engineer-of-Record and the TRB. | | | | |
| **TRB PDR Comments (Box #10-2)** | | | | |
|  | | | | |

Click here to enter text.**BLOCK NAME**Click here to enter text.

**Seismic Project Identification Report**

**APPENDIX A**

**SCOPE OF RETROFIT DETAILS**

**for**

**BLOCK #XX-X (BLOCK NAME)**

**SCHOOL NAME**

**TABLE A.1: Scope of Life Safety Retrofit**

|  |  |  |
| --- | --- | --- |
| **No.** | **Construction Activity** | **Approx. Quantity** |
| 1 |  |  |
| 2 |  |  |
| 3 |  |  |
| 4 |  |  |
| 5 |  |  |
| 6 |  |  |
| 7 |  |  |

**TABLE A.2: Scope of Enhanced Retrofit**

|  |  |  |
| --- | --- | --- |
| **No.** | **Construction Activity** | **Approx. Quantity** |
| 1 |  |  |
| 2 |  |  |
| 3 |  |  |
| 4 |  |  |

**Seismic Project Identification Report**

**APPENDIX B**

**SCOPE OF ARCHITECTURAL, MECHANICAL AND ELECTRICAL ENGINEERING WORK**

**for**

**BLOCK #XX-X (BLOCK NAME)**

**SCHOOL NAME**

**Introduction**

This appendix is comprised of stamped reports, one report for each discipline, for the scope of work for architectural, mechanical and electrical engineering work.

**Seismic Project Identification Report**

**APPENDIX C**

**RETROFIT COST ESTIMATE REPORT**

**for**

**BLOCK #XX-X (BLOCK NAME)**

**SCHOOL NAME**

**Retrofit Cost Estimate Report**

**Seismic Project Identification Report**

**APPENDIX D**

**LIQUEFACTION STRUCTURAL DETAILS**

**for**

**BLOCK #XX-X (BLOCK NAME)**

**SCHOOL NAME**

**Liquefaction Retrofit Structural Details**

**Seismic Project Identification Report**

**APPENDIX E**

**REPRESENTATIVE STRUCTURAL DETAILS**

**for**

**BLOCK #XX-X (BLOCK NAME)**

**SCHOOL NAME**

**Representative Structural Details**

**Seismic Project Identification Report**

**APPENDIX F**

**PHOTOGRAPHS**

**for**

**BLOCK #XX-X (BLOCK NAME)**

**SCHOOL NAME**

**Photographs**

**Seismic Project Identification Report**

**APPENDIX G**

**RELEVANT REFERENCE DOCUMENTS**

**for**

**BLOCK #XX-X (BLOCK NAME)**

**SCHOOL NAME**

**Relevant Reference Documents**