**Work Method** **WM-02-40-00–Demolition**

(Previously MCDC WM01- Demolition)

Per District of North Vancouver Bi-Laws.

**Written as an Industry Based Project (CMGT 8800)**

Rev 0 September 20, 2018, (see footer date for most recent version)

**Prepared by: Behrouz Chehrehpardaz**

Faculty Advisor: Jim Turnham, P. Eng, MASc., BCIT Faculty Advisor

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# SIGNATURE PAGE

As an Approver, with my signature, I confirm that this Work Method is the plan for construction of the work. If the plan changes, I will inform the Originator so that the Work Method can be revised. Alternately, I will make revisions myself and reissue to those that require copies.

As a Reviewer, my signature confirms that I have reviewed the document and any comments to the WM have been provided to the Originator and/or to the Approver.

COMPANY Construction Manager

Name: Date: \_\_\_\_ \_\_ Title: \_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_ Signature: \_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_

COMPANY Project Manager

Name: Date: \_\_\_\_ \_\_ Title: \_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_ Signature:\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_

Contractor or Subcontractor

Name: Date: \_\_\_\_ \_\_ Title: \_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_ Signature: \_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_

Initial Reviewer

Name: Date: Title: Signature:

# Proponent and Project Description

**Company Name: […]** (COMPANY)

**Company type of service:** COMPANY is a small construction company building Single Family Houses (SFHs) in North Vancouver, and the company’s vision is to be recognized as a model of quality excellence in construction.

**Project Description:** Under a Project Management/Design Build method, COMPANY itself or on behalf of the owners manages construction projects to build new single-family houses mostly in North Vancouver.

COMPANY contracts out all work activities in construction stage including the demolition of the existing buildings.

**Work Method Activity Description:** This Work Method (WM) provides the required details of how the demolition of existing building is carried out, and it is also subject to a series of inspections, before the commencement, during the work, and after completion. This Work Method will be used in order to ensure full compliance with COMPANY’s quality policy and Quality Plan, drawings, specifications, and BC Building Codes.

**Work Method Scope:** This work method shall apply to the demolition of all existing buildings that has been shown in demolition specs of the project.

**Limitation of liability:** Any organization engaged by COMPANY as a Contractor or Subcontractor (the Contractor) agrees to use this Work Method only under the condition that those that wrote and developed this Work Method are to be held harmless for any errors or omissions, any inaccuracies in content resulting in any damages to property or any injury to any personnel that may be involved. It remains the sole responsibility of the Contractor to review any and all items contained in the above Work Method and to make any changes that may be required in order to satisfy any project specification or any regulatory or statutory obligation. As well, the Contractor shall review any and all suggested methods as contained herein and shall make any changes required and shall reissue prior to commencement of construction in order to achieve the specified product or to provide a safe work site for all workers involved. Ownership and final responsibility for the use of all Work Methods remains with the Contractor.

# PURPOSE and SCOPE

**Purpose**: To define the responsibilities, describe methods and documentation to be used for demolition activities in COMPANY’s SFH projects.

**Scope**: This work method applies to all activities required for the building demolition at (the address of the project). Reference Standards include:

* British Columbia (or applicable province) Building Code 2012, or most recent.

Note: Construction documents (design drawings and specifications) should be referenced as applicable and will govern over any procedure included in this document.

# DEFINITIONS

COMPANY - [...]

CM - COMPANY’s Construction Manager

PM - COMPANY’s Project Manager

QC - Quality Control

WM - Work Method (this document)

WP **-** Work Procedure

TS - Task Step

CL - Checklist

RM - Review Meeting

NCP - Nonconformity Procedure

ITP - Inspection and Test Plan

BI - Before the TS Inspection

DI - During the TS Inspection

AI – After the TS Inspection

DNV - District of North Vancouver – (And if the project is in a different municipality, the By-laws of that jurisdiction shall govern)

NOP - Notice of Project

CTMP – Construction Traffic Management Plan (DNV)

# RESPONSIBILITIES

* 1. **Construction Manager (CM)** is responsible for project scheduling, and final approving the inspections, tests, and changes. The CM is also responsible for preparation of drawings and sketches to support construction as required and all making any changes if required.
	2. **Project Manager (PM)** is responsible for; identifying necessary resources and assigning individual responsibilities to run and monitor the quality control procedure that defined by COMPANY’s Quality Plan (QP) and this WM. He is responsible for overseeing the Quality Plan, enforcing project construction standards, assisting the CM in the creation of work method documents by providing appropriate sequence and task definitions, executing the project, scheduling and delegation of the roles of quality assurance inspections, safety, environmental items and Contractor coordination.
	3. The PM is accountable for the Site Superintendent’s responsibilities as well. The PM, for each WM contemplated for use at the site, provide a review and make changes if necessary to any clause so that it is consistent with best practice, consistent with the building code of the Province, and consistent with local conditions. Issues should be reviewed by email with the CM.
	4. **Site Superintendent** must work well with people and is responsible for:

Requesting copies of subcontractor’s liability insurance and workmen’s compensation certificate.

* + Overall site activities; applying project methodology and enforcing project construction standards; organizing field staff and ensuring they perform as required; and supervising Contractors and ensuring they perform as required
	+ Assisting the PM and the contractor in the creation and execution of work plans including revisions to these plans as necessary.
	+ Assisting the PM in supervision of Contractors’ work quality.
	+ Working closely with and support the Contractor to identify potential risks/opportunities, discuss necessary changes, and conduct the inspections.
	+ Scheduling and monitoring each workday with appropriately resources.
	+ Serving as the representative of and primary contact with the PM.
	+ Attending review meetings.
	+ Maintaining site logs and other documents in jobsite.
	+ Ensuring the jobsite safety and ensuring that safety practices are followed.
	1. **Trade Contractor or Subcontractor** (Contractor) refers to the company that is bound by contract to COMPANY for a certain scope of work. For their scope, the Contractor is responsible for environmental control, safety controls, and quality control for self-performed work. The Contractor is responsible to write his/her Work Methods. However, if the Contractor cannot provide the required WMs, COMPANY may assist, but the final WM will be reviewed, changes made to reflect project requirements, codes, laws, and resubmitted to COMPANY and owned by the Contractor. The Contractor performs the work required by the contract documents and approved Work Methods to start and complete the Project and fulfill everything indicated by the contract documents. The Contractor shall perform activities described in this WM. If any revision is needed, the Contractor shall be instructed to revise and update this WM so that the WM reflects the intent and methods of the Contractor as well. The Contractor shall be fully responsible for his means and methods, and for the content of the revised WM. The Contractor shall assign a representative who will permanently attend at the job site when the job is being done. The Site Manager or the Contractor’s site representative shall ensure following the guidelines and/or Standard Specifications outline on this work method.

# SAFETY AND ENVIRONMENT

All construction activities and job procedures shall conform to

* WCB Regulations and other applicable codes, regulations and acts
	+ Demolition (Part 20 Occupational Health and Safety Regulation)
	+ Asbestos (Part 6 Occupational Health and Safety Regulation)
* Properties Involving Controlled Substances Bylaw (Bylaw 7494)
* DNV Street and Traffic Bylaw (Bylaw 7125)
* DNV Noise Regulation Bylaw (Bylaw 7188)
* DNV Environmental Protection and Preservation Bylaw (Bylaw 6515)
* DNV Tree Protection Bylaw (Bylaw 7671)

The important items that everybody working in our construction site must comply with:

Maintain safe conditions for workers AND the public

* Neighborhoods
1. Respect and Communicate with neighbors
2. Do not encroach onto or destroy adjacent property
3. Do not block access to parking
4. Clean up on a regular basis
* The Environment
1. Respect and protect the natural environment
2. Protect storm drains and watercourses from siltation
3. Do not track dirt and mud onto streets and sidewalks
4. Contain waste and litter on site
5. Provide temporary toilets
* Noise
1. Restrict construction to allowable times
2. Restrict the use of equipment

All work process shall be fully consistent to DNV Bylaws, and all the Contractors, workers, site supervisors, and equipment operators are briefed with the potential hazards and process of demolitions.

All goods that are flammable are removed from the site unless it is used in the work involved. All the flammable materials like wood, timber, fuels etc. are stored in proper storage facilities. Firefighting appliances are stationed in the demolition site till the process is completed.

Suitable measures shall be undertaken to overcome those possible problems that may be faced by the workers such as exposure to dust, chemical exposure, and noise exposure.

Before signing the contract, the Demolition Contractor must have a qualified person inspect the site to identify any asbestos that may be handled, disturbed, or removed.

# SUBMITTALS

The contractor submittals to COMPANY:

* Contractor Quotation for doing the job described in COMPANY’s RFQ package, including
	+ Contract price and time (including the start time of work on site)
	+ Declaration of accepting all contract terms and documents
	+ Written promise to provide the required submittals (including Contractor’s Work Method and Checklists), 14 days prior to the work start
	+ Documented processes and submittals to enable the PM review
	+ Contractor’s initial Work Method, Checklists, and ITP for COMPANY review
* The final revision of COMPANY QP reviewed and confirmed by the Contractor
* Finalized WM, ITPs, Checklists, and any other documents required by the contract documents, not later than 7 days prior to the work start time, (COMPANY CM written confirmation required)
* Any drawing, specs, and designing layout which is required for carrying out the work, and in order to satisfy any project specification or any regulatory or statutory obligation.
* Reports that identify the self-inspection result and scope of work, before each COMPANY scheduled inspection

All contractor submittals are stated in the Contract and include (but not limited to)

* Posted on site
	+ Exposure Control Plan for Asbestos and any other hazardous materials to be removed.
	+ Risk Assessment performed by qualified person
	+ Detailed Work Procedures
	+ Hazardous Materials Survey Report
* A report that identifies all inspection results and scope of work for the abatement of the asbestos.
* After the asbestos removal, a **Confirmation Letter** stating that the asbestos identified in the survey has been removed.
* A crawler excavator
* A mini excavator

# PROCEDURE

## General Requirements

Consult the specifications and construction drawings to determine the requirements for any aspect of the work. This Work Method is a guideline used by COMPANY to describe the work process and the process of quality control by conducting the specific Inspections and relevant Checklists. The Drawings, and Specifications as well as any code and by-law are the ultimate requirements. The PM and the Contractor shall review the Work Method and make any revision (prior to each use if necessary) so that any requirements will be identified and met.

The following Task Steps (TS) (procedures) are included in this Work Method:

* 9.2 Removal of Hazardous Materials (TS1).
* 9.3 Demolition (TS2).

Each TS comes with a Checklist and each Checklist is subject to three Inspections, before, during, and after completion of the TS. The Checklist includes several checkpoints which must be controlled and verified by the COMPANY’s PM or Site Superintendent. To continue the work and proceed to next step, the Contractor must obtain the approval of PM for all Inspections. The PM will give the approval only if all Checklist’s items are checked and passed.

The Inspections and Testing shall follow the instructions described in the Inspection and Testing Plan number 01 (ITP01). The PM shall review the results of the ITP and Checklists, and check if the results are acceptable. The PM will communicate the acceptable results to the CM; and if the results are not acceptable, the PM will communicate this issue to the CM and the Contractor to evaluate the default and issue instructions for the corrective actions.

## Removal of Hazardous Materials (TS1)

Before you begin:

* A qualified person shall inspect the site to identify the presence of wastewater, Hazardous Materials (HMs), matters arising from toxic chemicals, flammable or explosive and radioactive materials, etc.
* A qualified person inspects the house/building, collects representative bulk samples, and has the samples analyzed by a qualified laboratory.
* The qualified person prepares a report that identifies all inspection results (including drawings, plans, or specifications), risk assessment, and scope of work for the abatement of the asbestos.
* The report containing the inspection results is provided to the CM. The inspection results must be available at the worksite whenever workers are on site.
	+ 1. If hazardous materials like asbestos minerals are found in the investigation of site for demolition, a specialized Contractor must be called for the safe removal and disposal of identified asbestos and other hazardous materials from the site.
		2. A Notice of Project (NOP) with written work procedures is submitted to WorkSafeBC before commencement of asbestos removal work. The NOP must be filed with WorkSafeBC 24 hours prior to removal work starting, including documentation listed in 8.2.3.
		3. The Following documents Shall be posted on site:
			1. Exposure Control Plan for Asbestos and any other hazardous materials are to be removing.
			2. Risk Assessment performed by the qualified person
			3. Detailed Work Procedures
			4. Hazardous Materials Survey Report
		4. After the asbestos removal the PM receives written **Confirmation Letter** stating that the asbestos identified in the hazardous material survey and the NOP has been removed. A copy of the inspection results is to be posted on site.
		5. The demolition Contractor proceeds to demolish house using safe work procedures and a copy of inspection results and post-abatement reports shall be always on site.
		6. If any asbestos is found during demolition, all work is to cease until a risk assessment is done and the asbestos is safely contained or removed. In this case, go back to step 8.2.1.



|  |  |
| --- | --- |
|  | Checklist 01-1: **Removal of Hazardous Materials (TS1)** |
| Company | Project: | Contractor: |
| **Number** | **Checkpoints** | BI | DI | AI |
| **1** | DNV permit/inspection approval as required |  |  |  |
| **Comment** |  |
| **2** | HMs Inspection and assessment performed by the qualified person |  |  |  |
| **Comment** |  |
| **3** | NOP is filed with WCB 24 hrs prior to work starting  |  |  |  |
| **Comment** |  |
| **4** | The required documents have been prepared and posted on site |  |  |  |
| **Comment** |  |
| **5** | Are appropriate barriers and signs erected? |  |  |  |
| **Comment** |  |
| **6** | The Confirmation letter includes the proof of waste disposal |  |  |  |
| **Comment** |  |
| **7** | Is a hot water unit for personal washing |  |  |  |
| **Comment** |  |
| **8** | Waste storage on site in a secure area (like a locked lidded bin) |  |  |  |
| **Comment** |  |
| **9** |  |  |  |  |
| **Comment** |  |
| **Quality Scores and Completion Sign-off** |
| **Inspection#**Quality 5 4 3 2 1 Notes:On-Time 5 4 3 2 1 Notes:Sign and date\*: Cell # / ID #: Signed: Date: Task has been verified complete and in compliance with contract drawings and specifications except for non-conformances and incomplete items reported above. |
| **BI=** Inspection **B**efore task begin **-----------DI=** Inspection **D**uring task in-process --------**AI=** Inspection **A**fter task completed*Quality Score**5 = 100% NO problems 4 = 1 minor problems 3 = Hotspot or 2-3 minor 2 = 6+ or major problems 1 = Excessive problems****On-Time Score*** *5 = On Time 4 = Late 3 = Late by 1 day 2 = Late by 2 days 1 = Late more than 2 days****Safety Score*** *5 = 100% NO problems 4 = 1 minor problem 3 = Hotspot or 2-3 minor 2= 4+ or major problem 1= Injury* |

## Demolition (TS2)

Before you begin:

* Follow up that the DNV Building Department has notified the Utility providers for a disconnection of service prior to permit issuing.
* Ensure all services (utilities), including electricity; water; sewage; and gas, are disconnected (Cut-Off) and capped properly according the DNV Bylaws.
* Ensure all required permits and certificate are in site
* Ensure all personnel are briefed with the potential hazards and process of demolitions.
* Clear and grub backyard and front yard, removing all trees and vegetation except the ones specified in the Demolition permit.
* Communicate effectively with the neighbourhood the time of demolition and traffic disruptions that may caused by the trucks transportation.
	+ 1. The PM reviews the drawings and discuss the details with the Contractor.
		2. The PM and the Contractor prepare a detailed demolition plan which shows:
			1. The location of the building to be demolished.
			2. The distances from the building to be demolished to its adjacent buildings, streets, structures and significant street furniture.
			3. The structural support systems of the building.
			4. The procedure for the demolition of the building; detailed sequence of demolishing structural members; and the method of demolition to be adopted.
			5. Precautionary measures include the protection of the public including hoardings, covered walkways, catch platforms, catch fans, scaffolding, protective screens and safety nets.
			6. Method of handling demolished building debris.
			7. Time required for the complete demolition process.
		3. The Contractor demolishes and removes existing building. The Contractor also breaks and removes concrete foundation.
		4. To respect the Disposal Application requirements, loads containing mixed waste, recyclable materials including brick & block, asphalt, concrete, wood, scrap metal, and drywall, will be removed separately and placed in the appropriate piles (source separation of materials).

* + 1. The Contractor shall maintain the Work in a safe and tidy condition and free from the accumulation of waste products and debris.
		2. Before applying for Substantial Performance of the Work, the Trade Contractor shall remove waste products and debris.
		3. The Trade Contractor shall remove products, tools, Construction Equipment, and Temporary Work not required for the performance of the remaining Work.
		4. Ensure that the disruptions to the community and traffic associated with the demolition activity are minimized, by following the DNV’s CTMP guidelines







|  |  |
| --- | --- |
|  | Checklist 01-2: **Demolition (TS2)** |
| Company | Project: | Contractor: |
| **Number** | **Checkpoints** | BI | DI | AI |
| **1** | All permits required by District and others are obtained  |  |  |  |
| **Comment** |  |
| **2** | Demolition contractor has a valid license |  |  |  |
| **Comment** |  |
| **3** | The detailed demolition plan reviewed with the PM and Contractor  |  |  |  |
| **Comment** |  |
| **4** | The recyclable waste is sorted by type as DNV requirement |  |  |  |
| **Comment** |  |
| **5** | Debris is removed from the site when a full load is accumulated |  |  |  |
| **Comment** |  |
| **6** | If debris is stored in a stockpile, is it stable? |  |  |  |
| **Comment** |  |
| **7** | Site has been cleaned properly and ready for Excavation |  |  |  |
| **Comment** |  |
| **8** | The street traffic is properly managed  |  |  |  |
| **Comment** |  |
| **9** | Site has been cleaned properly and ready for Excavation |  |  |  |
| **Comment** |  |
| **Quality Scores and Completion Sign-off** |
| **Inspection#**Quality 5 4 3 2 1 Notes:On-Time 5 4 3 2 1 Notes:Sign and date\*: Cell # / ID #: Signed: Date: Task has been verified complete and in compliance with contract drawings and specifications except for non-conformances and incomplete items reported above. |
| **BI=** Inspection **B**efore task begin **-----------DI=** Inspection **D**uring task in-process --------**AI=** Inspection **A**fter task completed*Quality Score**5 = 100% NO problems 4 = 1 minor problems 3 = Hotspot or 2-3 minor 2 = 6+ or major problems 1 = Excessive problems****On-Time Score*** *5 = On Time 4 = Late 3 = Late by 1 day 2 = Late by 2 days 1 = Late more than 2 days****Safety Score*** *5 = 100% NO problems 4 = 1 minor problem 3 = Hotspot or 2-3 minor 2= 4+ or major problem 1= Injury* |

# Quality Assurance Approval

Only if all 6 required Inspections associated with 2 TS Checklists mentioned in this WM are approved by the PM and the CM as OK, the PM will carry out the final Inspection and issues the written approval if the results are OK.

If the results do not match the allowable tolerances, the PM will communicate this issue to the CM who evaluates the NCs and issues instructions for the corrective actions to be taken.

Any non-conformance shall be reported through the NCR procedure described in COMPANY’s QP and is applicable to any and all phases of the Demolition.

#  References

1. The Handouts and QMS documents provided by Mr. Jim Turnham (CMGT-7246)
2. Based on Behrouz Chehrehpardaz work experience
3. All pictures are taken during COMPANY’s last project at 4438 Ranger Ave, North Vancouver
4. BC Building Code
5. WorkSafeBC Regulations
6. DNV Bylaws

#  Construction Organization Chart

COMPANY Board of Directors

Construct Manager / CEO

Project Manager

Site Superintendent

Trade Contractor (also called Subcontractor)

# Flow Chart

END

WM/ITP

Contract

QP

Specs

Dwgs

Pre-Work WM Review Meeting

Certificate of Completion

NCP

Corrective Action

Initial Inspection

 yes YES

Final Inspection

Passed?

 NO/NCP

Inspection

Passed?

 YES YES

(BI & DI & AI) Inspections

Passed?

Removal of Hazardous Materials

 NO/NCP

 NO/NCP YES

Demolition

(BI & DI & AI) Inspections

Passed?

#  Inspection and Test Plan

|  |  |  |
| --- | --- | --- |
|  MC Development Corp | Inspection and Test Plan # 01**Demolition** | PM: COMPANY Project ManagerC / SC: Contractor or Subcontractor (organization doing the work) |
| Contractor: | Project: |
| **#** | **Inspections** | **To Inspect Items listed in** | **Time of Inspection** | **QC****by** | **Acceptance Criteria** | **H/W/D** | **Score &****(lowest)** | **Initials** | **Date** |
| 1 | Initial Inspection | QMP 4.3 (previously 004b) | Prior to any work | C / SC | CM approval | H |  |  |  |  |
| 2 | HM Removal BI | Checklist 01-1 | Prior to TS1 | C / SC | PM Approval |  |  |  |  |  |
| 3 | HM Removal DI  | Checklist 01-1 | During TS1 | C / SC | PM Approval |  |  |  |  |  |
| 4 | HM Removal AI | Checklist 01-1 | After TS1 | C / SC | PM Approval |  |  |  |  |  |
| 5 | Demolition BI | Checklist 01-2 | Prior TS2 | C / SC | PM Approval |  |  |  |  |  |
| 6 | Demolition DI | Checklist 01-2 | During TS2 | C / SC | PM Approval |  |  |  |  |  |
| 7 | Demolition AI | Checklist 01-2 | After TS2 | C / SC | PM Approval |  |  |  |  |  |
| 8 | Final Inspection | List of NCs | After Completion | PM | CM Approval |  |  |  |  |  |
| ITP Accepted by ……………………… Signature ……………………………… Date ……………. |
| **(BI**: Inspection Before Task Begin----**DI**: Inspection During Task Work----**AI**: Inspection After Task Finished) **(W**: Witnessed by CM---- **H**: Hold further work----**D**: Document) |