

Alberta Wildland Interface Fire Structure Protection Program Operational Guidelines



ALBERTA MUNICIPAL AFFAIRS
TECHNICAL AND CORPORATE SERVICES
COMMUNITY AND TECHNICAL SUPPORT
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Definitions and Acronyms

AAR	After Action Review
AB DLAN	Alberta Disaster Local Area Network
AEMA	Alberta Emergency Management Agency of Alberta Municipal Affairs
All In	the referenced price includes the vehicle, insurance, minimum equipment & appliances, minimum personnel, fuel, and routine maintenance.
MA	Alberta Municipal Affairs
CIFFC	Canadian Interagency Forest Fire Center
FPA	Forest Protection Area
GOA	Government of Alberta
IAP	Incident Action Plan
IC	Incident Commander
ICS	Incident Command System
IMT	Incident Management Team
OHS	Occupational Health and Safety Act, Regulation & Code
MA	Municipal Affairs
NFPA	National Fire Protection Association
POC	Provincial Operations Centre of AEMA
PPE	Personal Protective Equipment

Responding Organization – The municipal fire department or contractor that is providing resources for an MA managed structure protection deployment in response to a request from a Responsible Organization.

Responsible Organization – the organization requesting MA managed structure protection resources that will be determined by the Province as being responsible for the costs incurred in providing structure protection resources. This may be the WMB, a municipality or a site owner.

SPL	Structure Protection Leader
SPM	Structure Protection Member
SPS	Structure Protection Specialist

WHMIS – Workplace Hazardous Materials Information System

WMB – Wildfire Management Branch of Alberta Agriculture and Forestry

WUI – Wildland Urban Interface

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Introduction

Alberta Municipal Affairs (MA) developed the Alberta Wildland Urban Interface Fire Structure Protection Program (“Structure Protection Program”) in conjunction with the Alberta Wildfire Management Branch (WMB) and the Alberta Fire Chiefs Association in 2018. The goal of the Structure Protection Program is to strengthen the capacity for protection for buildings and structures from wildfires, while providing flexibility to deploy trained and capable resources with clear rules of engagement and reimbursement requirements. MA is currently reviewing the appropriate administrative framework and management of the Structural Protection Program with Alberta Agriculture and Forestry.

The Operational Guidelines (“Guidelines”) provide response procedures for municipal firefighters and private contractors. The Guidelines also set reimbursement rates for personnel, apparatus, and specialty equipment and establish minimum standards for apparatus, training, and experience of personnel pre-deployment.

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1. Program Overview

The Guidelines provide standards and procedures related to:

- Structure protection personnel positions
- Training and qualification standards
- Deployment procedures
- Reimbursement rates and guidelines
- Safety and emergency procedures
- Operational and financial responsibilities
- Program maintenance and revision
- Structure protection technical and administrative templates
- Engagement, accountability and payment procedures

The Guidelines are reviewed on an annual basis by MA in consultation with the WMB and stakeholders with the revised version prepared annually.

2. Incident Organization and Personnel Positions

2.1 Incident Command System

Each Wildland Urban Interface (WUI) incident follows the Incident Command System (ICS). The ICS is a standardized approach to the command, control, and coordination of emergency response. The ICS provides a defined chain of command where each member has one specific person to report to.

The ICS provides for the use of common terminology, clear lines of communication, inter-agency coordination and organizational flexibility.

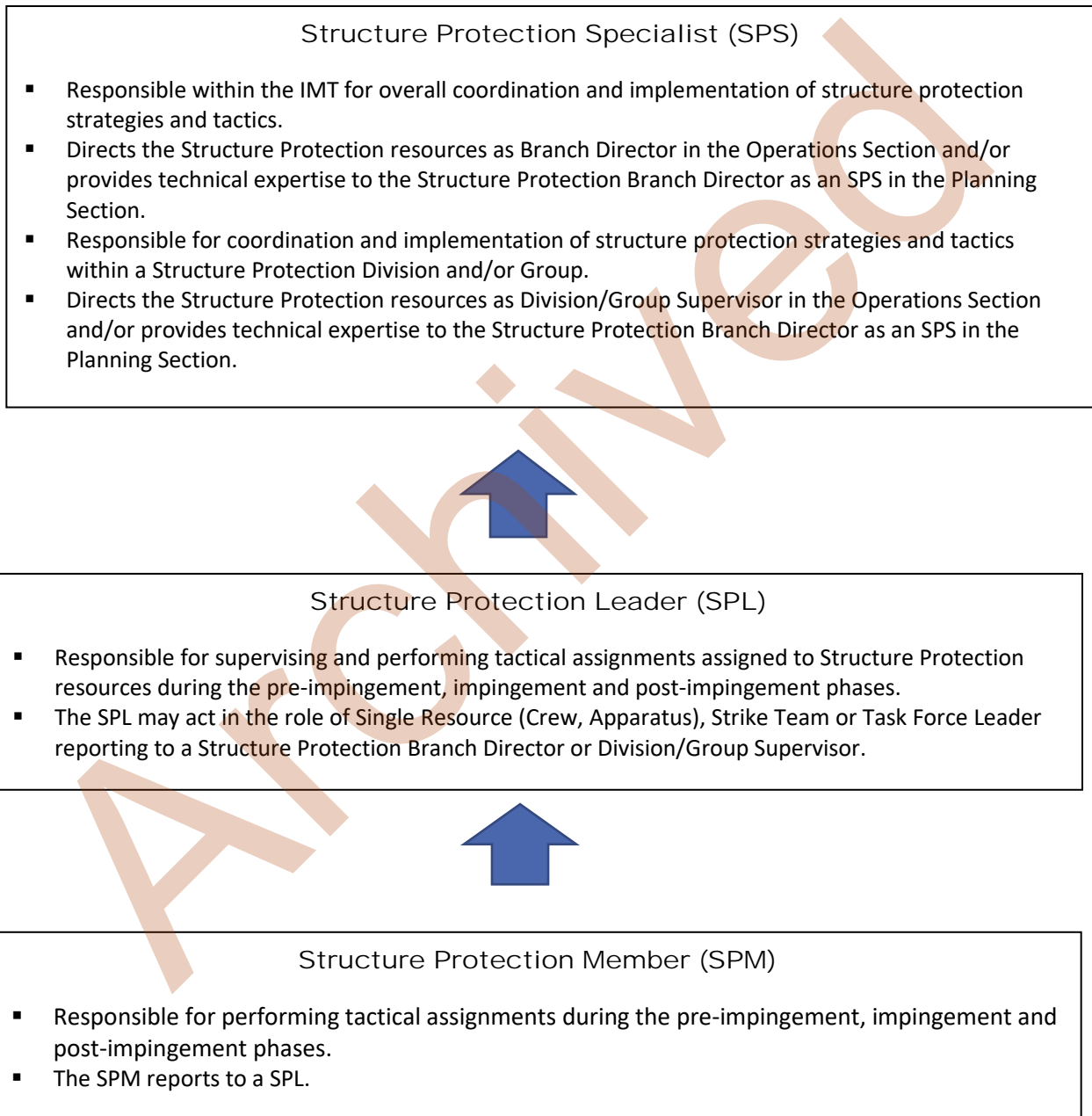
Based on the incident size and complexity, the Incident Management Team (IMT) determines the organizational structure utilizing the ICS Canada model (Figure 1). Consideration should be given to the establishment of Unified Command between WMB and the local municipality when appropriate.

(Figure 1)



2.2 Personnel Positions

Structure Protection personnel positions are based upon the qualifications, training, and experience of the individual and determine the ICS roles to be filled based upon the type and level of activation. Roles, responsibilities and kit lists are provided for each position in Appendix I.



3. Training and Qualification Standards

Training and qualification standards for each of the Structure Protection Program positions ensures that each member is appropriately trained, qualified and competent.

1. Operational tasking of structure protection personnel is commensurate with training, qualifications and experience.
2. All SPMs and SPLs are required to have the NFPA 1001 training and qualifications listed.¹
3. Contract “engine/tender water supply only” members and leaders are **not** required to have the NFPA 1001 training and qualifications listed provided their only task is engine/tender water supply but, must have ICS 100, Standard First Aid, WHMIS, WMB’s online safety training and wildfire orientation with SPM preferred.
4. Municipal, Provincial, and contract SPS’s are required to meet all NFPA, CIFFC, and WMB standards listed.

The Fire Chief (Municipal Fire Department) or Executive (Contractor) from the responding organization is responsible for ensuring that all personnel meet the minimum training standards and are competent to perform the position tasks, before deployment.

MA requires electronically submitted proof for verification of qualifications and experience (one submission per person) before entering into contracts for deployment.

¹ NFPA 1001, Standard for Fire Fighter Professional Qualifications, Current Edition: 2019

Structure Protection Team Qualifications (Table 1)

NOTE: Equivalencies will be recognized at the discretion of the Fire Commissioner.

Position	Minimum Qualifications	Minimum Experience
Structure Protection Specialist	All SPL qualifications plus: -ICS 300 (ICS 400 is preferred) -Advanced wildfire behavior training -Advanced mobile engine operations training is an asset.	Served in a leadership role with extensive WUI fire situations and structural protection experience.
Structure Protection Team Leader	All SPM qualifications plus: -NFPA 1001 Fire Fighter Level II -NFPA 1021 Fire Officer Level I OR equivalent -Basic ICS (I-200) -Fire Ops in the WUI (S-215) OR equivalent	Served on at least three WUI fires as a team member and fire-related leadership experience.
Structure Protection Team Member	NFPA 1001 Fire Fighter Level I -ICS Orientation (I-100) -NFPA 1051 Wildland Firefighter I OR Wildfire Crew Member Type I -Wildfire Orientation for Municipal Firefighters (online course) -Exterior sprinkler and portable pump training -Current Standard First Aid/CPR Level C -WHMIS	Minimum of one year as an active structural firefighter; or on a wildfire crew.

4. Deployment

Apparatus and personnel deployed by the Province are considered a provincial resource during the deployment. The Province determines any decisions to re-deploy or release after consultation with the involved parties.

Upon the request of the WMB or Senior Municipal Officials for assistance to local fire departments and their mutual aid partners, MA deploys structural protection resources. The requesting party is responsible for expenses as per Section 5.

At all times during wildland-urban interface structural protection events, Occupational Health and Safety (OHS) Act, Regulation, and Code requirements apply including those requirements for respiratory safety.² If conditions on the scene are not compliant with OHS requirements, all fire service members must cease operations immediately and evacuate.

During deployments, liability insurance and Workers Compensation Board (WCB) coverage is the responsibility of the responding municipality or the contractor. MA requires written confirmation at the time of entering into a contract that all requested municipalities and contractors have \$5.0M liability insurance and WCB coverage for all personnel. MA requires proof of coverage before dispatch.

Maintaining situational awareness within MA is paramount, and organizations are encouraged to advise the Fire Commissioner of active or planned deployments of structural protection resources within their jurisdictions. This allows MA to develop provincial strategies to deal with emerging issues promptly and to anticipate potential short and long-term resource requirements.

Note: Self deployed resources will be returned to their home base without compensation.

4.2.0 Pre-Deployment

MA maintains a current database of the structure protection resources comprised of municipal fire departments and contractors available for provincial deployment.

² Occupational Health and Safety Act, Regulation and Code (2020) *Alberta Regulation 87/2009 2019 Current as of January 31*, Alberta, Queens Printer

Municipal resources must have approvals from their CAO or person with signing authority and provide proof in writing for review before entering into a contract with MA.

Each organization providing resources for provincial structure protection deployment is required to provide a manifest and an inventory checklist (Appendix II) for **ALL** apparatus, SPUs, personnel, and equipment to MA at firecomm@gov.ab.ca, pre-deployment and to the receiving organization upon check-in at the incident.

Resources deployed by MA may be required to report to a location at or near the incident where inspections for mechanical safety, proof of vehicle insurance, equipment, PPE, inventories and readiness for duty can be verified.

4.2.1 Requesting Resources

Requests for WUI structural protection resources outside the jurisdiction of the local authority are the responsibility of MA and are sourced and deployed from MA's resource list.

The IMT may through their approved procurement process request structural protection resources from MA by contacting the Provincial Operations Center (POC) and supply the following information:

- Requesting party, contact name, and phone number
- Incident name and location
- Resources requested; kind, type, and quantity (refer to Section 5)
- Expected task
- Required arrival date and time for each resource
- Reporting location
- Any special requirements

The POC then creates an AB DLAN ticket and contacts the MA POC representatives from Technical & Corporate Services Division at MA to comply with the request from MA's list of structure protection resources.

For tracking and billing purposes, the AB DLAN ticket number is provided to all organizations at the time of their deployment. The AB DALN ticket number must appear on all timesheets and invoices. If applicable, the WMB Fire Identification Number must also appear on all timesheets and invoices.

4.3 Deployment

4.3.1 Deployment Periods

Deployment periods for incidents requiring provincial resourcing of apparatus and personnel should prepare for a minimum of 4 days on-site and a maximum of 14 days on-site. **MA may revise deployment periods based on resource availability, incident complexity, hazards and exceptional circumstances negotiated between MA and the responding organization or contractor.**

Fire department costs associated with crew rotations within the 4 to 14 day on-site deployment parameters, including wages, transportation, and authorized expenses are compensated by MA. Fire departments choosing to rotate personnel out before a minimum of four days on-site shall do so at their own expense or as agreed to by MA before the deployment. **Costs for backfilling personnel at the responding organizations' home base is not covered or supported under this program.**

Upon arrival at the predetermined destination, all resources will check-in with the IMT. Manifests and inventories will be verified a representative from the IMT before proceeding. A tactical briefing shall take place before resources are assigned to tactical actions.

A timesheet for travel to the incident is required as per 4.3.6.

4.3.2 Personnel and Apparatus Transport

MA maintains a list of approved and contracted commercial transportation providers for both personnel and equipment. Vehicles belonging to the contracted organization used to transport are personnel are eligible for reimbursement as per the rates provided in Section 5.

The current Government of Alberta (GOA) Travel and Meal Reimbursement and Allowance Rates are provided in the table below.

Expense Type	Section Reference	Reimbursement with receipt	Allowance without receipt
Breakfast	9(4)	Actual expense	\$9.20
Lunch	9(4)	Actual expense	\$11.60
Dinner	9(4)	Actual expense	\$20.75
Mileage Allowance	8(14)(a)	N/A	\$0.505 per km travelled

Some personnel, equipment, and apparatus may require the use of commercial transportation to get to the incident. All commercial transportation costs including the movement of SPUs must be approved by MA before being moved. Pre-approved commercial transportation costs paid by the responding organization may be eligible for reimbursement at with supporting receipts.

4.3.3 Personal Protective Equipment

All fire department and contract personnel responding to a provincial deployment shall have the minimum personal protective equipment listed in Section 6 and meeting or exceeding agency policy and provincial legislation. Expendable items such as gloves and masks that are damaged or worn-out during the response are eligible for reimbursement by the MA when supported by receipts.

4.3.4 Food and Lodging

Food and lodging may not be immediately available when responders check in at the scene. All responding personnel should be prepared to be self-sufficient for a minimum of 2-4 days, this includes food, bedding and shelter.

MA compensates eligible food and lodging costs incurred during travel to and from the incident at cost with reasonable receipts or the GOA Travel and Meal Reimbursement and Allowance Rates.

When meals and lodging are not provided on-site crews will be responsible for the upfront costs which can be remitted with receipts. GOA Travel and Meal Reimbursement and Allowance Rates shall apply.

No meal or lodging claims are allowable if there is a provision for meals and lodging on-site.

Crews deployed to WUI incidents within one-hour of home base are not eligible for food and lodging costs unless pre-approved by MA and the Incident Commander (IC).

Crews may be housed at a fire camp, hotel or appropriate community buildings.

4.3.5 Communications Equipment

The IMT determines the most effective manner of communication between structure protection resources and the command structure. Responding resources should deploy with adequate radio supplies to communicate with their personnel.

4.3.6 Record Keeping

The senior member of each crew is responsible for ensuring the completion of timesheets (see Appendix 1) - one timesheet for each crew member each day. The division supervisor is responsible for the approval of timesheets and submitting them to finance at the end of the operational period.

The **AB DLAN Ticket Number**, and the **WMB Identification Number** (if applicable) must appear on all timesheets prior to submission.

4.4 Post-Deployment Procedures

MA shall only release provincially deployed apparatus and personnel after consultation with the IC of the IMT. **Released resources are subject to incident demobilization and check-out procedures before leaving the incident.**

Some deployed equipment may be left on-scene by the departing resource until the incident has terminated. Resources leaving equipment on-scene can expect to use substitute items until the return of their equipment.

The SPS must receive a complete list of missing or damaged equipment at the demobilization check-out. Claims for missing or damaged equipment not declared at check-out are ineligible.

Timesheets for travel to home base are required to be submitted as per 4.3.6.

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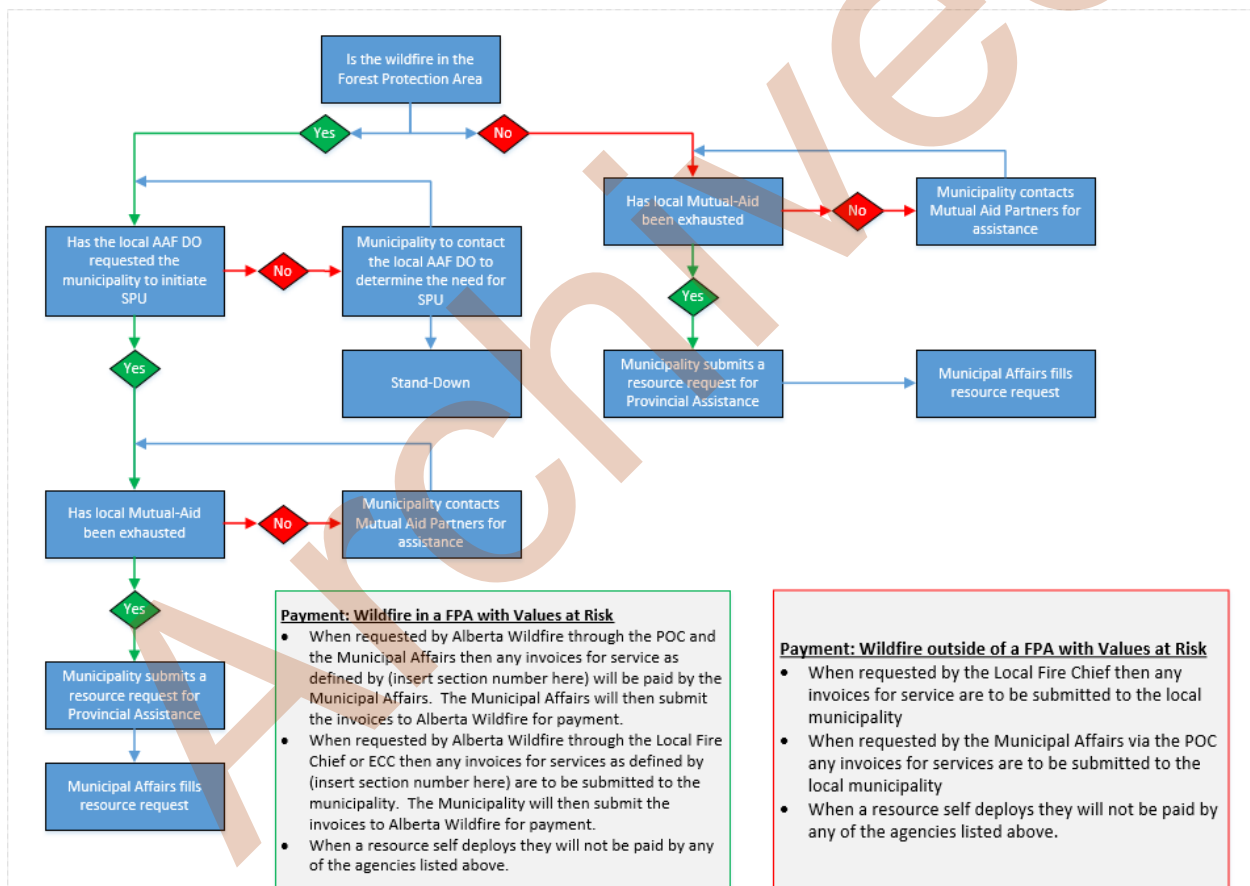
5. Reimbursement Guidelines

Existing mutual-aid agreements are not affected by these guidelines.

MA reimburses municipal fire departments and contractors providing resources requested by the Province. MA will seek reimbursement from the WFB for resources deployed inside the FPA, the requesting party is responsible for payment of resources outside of the FPA as outlined below.

Point of Origin	Responsible Organization
Inside the FPA when requested by WMB	WMB
Outside the FPA	Local Municipal Authority or site owner

(Figure 2)



Local municipalities with structure protection resources and those with mutual aid partners having structure protection resources should utilize resources in collaboration with the WMB as appropriate before engaging MA. Requests for additional resources follow the sequence laid out in Section 4.1.

Reimbursement for hours traveled or worked

Departments returning to their home jurisdiction daily, if less than one hour from the incident, are eligible to be reimbursed for actual hours worked and traveled each day. **Note** – operational periods are for a maximum of 12 hours per day unless the IC or MA gives express written permission to the contrary. MA makes decisions to put resources on standby in consultation with WMB and local impacted municipalities based upon risk and potential hazards.

MA may call for structure protection resource pre-positioning or standby that is not directly related to an interface wildfire (e.g., extreme wildfire hazard in an area or high risk of human-caused ignitions). MA covers reimbursement for standby initiatives if MA is making the formal request.

Standby time may take two forms and both must be authorized by MA and in advance.

Standby at home base (ready to deploy – usually two within hours)

Crew members, leaders and specialists are eligible for 25% of their hourly rates (see 5.2) for up to 8 hours per day for a commitment to be deployed at any time of day within 2 hours of the request. Apparatus and equipment are ineligible for standby pay.

If the standby crew, apparatus or equipment becomes unavailable for deployment within the two-hour minimum, notify the MA representative from Technical & Corporate Services immediately.

Standby away from home base (pre-positioned and staged as "ready" resource at an incident or in anticipation of an ignition):

Crew members are eligible for the designated hourly rates of up to ten hours per day. The SPS may assign pre-planning, orientation and pre-suppression activities while ensuring 100% readiness of all personnel and equipment to be deployed. The SPS may direct crew members and leaders to familiarize themselves with the incident and the local area, including roadways, water sources and other potentially useful assets and infrastructure via maps, plans and reconnaissance where these activities do not interfere with incident operations.

Apparatus will be covered for 100% of established rates during travel and 65% of established rates during staged standby (not standby at home) for up to 8 hours per day. SPU rates are at the "closed" rate during travel and standby.

The reimbursement rates contained within this section are for **municipal fire department equipment and staff**.

Private contractor equipment and personnel rates shall adhere to the contract entered into following their submission of pricing. Contractor pricing includes personnel, fuel and maintenance.

Where the guideline does not list a piece of equipment or personnel type, payment shall be in accordance with the following rates:

- Current Alberta Road Builders and Heavy Construction Association Equipment Rental Rates Guide.³
- Current Alberta WMB Equipment Rates,⁴ or
- A specific contractual agreement with MA.

NOTE:

- Costs for apparatus or personnel above the numbers specified in this document **are not** covered unless authorized in advance by MA.
- Unique resources not included in the Guidelines follow the contracted rates between MA and the provider.
- Consumables such as foam, when requested within the incident command structure, are reimbursed by MA at the documented cost.

Reimbursement rates for apparatus, equipment and personnel are listed in Sections 5.1 and 5.2 and are based on the following formula.

Apparatus / Equipment Rate (5.1)	+	Personnel Rate (5.2)	+	Expenses	=	Total Rate
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5.1 Apparatus and Equipment Rates

The typing of the apparatus in this document is according to the CIFFC Mutual-Aid Resources Sharing (MARS) Agreement.⁵

³ Alberta road builders & heavy construction association (2020). Equipment rental rates guide and membership listing directory. Winnipeg: Lester

⁴ Government of Alberta. (2020). *Alberta Wildfire Payment Directive*. (ISBN 978-1-46014727-6).

⁵ NWCG#006-2008 Engine and Water Tender Typing Standards. Retrieved from:
<https://www.nwcg.gov/sites/default/files/memos/eb-m-08-006.pdf>

All apparatus are to have a valid safety inspection certificate, operationally ready and be equipped with appropriate appliances, nozzles, spanners and hand tools. The reimbursement rates below include:

- vehicle insurance;
- all minimum required equipment and appliances;
- fuel;
- cleaning; and,
- routine maintenance costs.

All apparatus types shall meet federal, provincial, and agency requirements for motor vehicle safety standards, including all gross vehicle weight ratings (GVWR) when fully loaded.

Type 3 Engines and Tactical Water Tenders require a foam proportioning system.

All Water Tenders and Type 3-6 Engines shall be able to prime and pump water from a 3-meter lift.

Additional items (add-ons) that may be requested by the Province include:

- Four-wheel drive
- High-pressure pump
- Foam proportioner
- Compressed air foam system (CAFS) – 40 cfm minimum
- Additional personnel

Rates are for apparatus only. Section 5.2 contains Personnel rates.

5.1.1 Engines

Minimum Requirements	Engine Type						
	Structure		Wildland				
	1	2	3	4	5	6	7
Tank capacity (Litres)	1100	1100	1900	2800	1500	570	190
Pump flow (lpm)	4000	2000	550	200	200	200	40
@ Rated pressure (kpa)	1000	1000	1700	700	700	700	700
Hose 65mm (m)	360	300	-	-	-	-	-
Hose 38mm-45mm (m)	150	150	300	90	90	90	-
Hose 25mm (m)	-	-	150	90	90	90	60
Ladders as per NFPA 1901	Yes	Yes	-	-	-	-	-

Master Stream – 2000 Lpm	Yes	-	-	-	-	-	-
Pump & roll	-	-	Yes	Yes	Yes	Yes	Yes
Maximum GVWR (kg)	-	-	-	-	11,800	8850	6350
Personnel*	4	3	3	2	2	2	2
Rate per Hour	\$250	\$250	\$250	\$250	\$250	\$250	\$75

5.1.2 Aerial, Platform, or Tower Elevated Master Stream

Minimum Requirements	Truck Company Type	
	1	2
Aerial (Meters)	20	15
Master Stream Flow Rate (Lpm)	2000	2000
Ground Ladders (Meters)	35	35
Personnel	4	4
Rate per Hour All 5.1.2 apparatus shall have an onboard pump with a minimum of 4000 Lpm capacity	\$600	\$500

5.1.3 Tenders

Minimum Requirements	Tender Type				
	Support			Tactical	
	S1	S2	S3	T1	T2
Tank capacity (Litres)	15,000	9500	3800	7600	3800
Pump flow (lpm)	1100	800	800	1000	1000
@ Rated pressure (kpa)	350	350	350	1050	1050
Pump & roll	-	-	-	Yes	Yes
Personnel	1	1	1	2	2
Rate per Hour	\$250	\$250	\$250	\$250	\$250

5.1.4 Structure Protection Units

Minimum Requirements	Type		
	1	2	3
Number of Structures Protected	31+	21-30	10-20
Personnel (12 hour shift)	4	4	4
Rate per Day Open with Equipment Deployed	\$4800	\$3200	\$1600
Closed with No Equipment Deployed	\$2400	\$1600	\$800

5.1.5 Other

Kind	Rate per Day
All-Terrain Vehicle (ATV)	\$100
Utility Task Vehicle (UTV)	\$125
Truck, ½ - ¾ ton, SUV, 4X4 (less than 200 km/day)	\$250
Truck, ½ - ¾ ton, SUV, 4X4 (200 and up km/day)	\$325
Truck, 1 ton, 4X4 (less than 200 km/day)	\$275
Truck, 1 ton, 4X4 (200 and up km/day)	\$350
Full Size Van, 12-15-passenger	\$145
Enclosed trailer (up to 20 ft)	\$75

Note: ATV and UTV rates include transport trailer as required

5.2 Personnel Rates

A Structural Protection Crew will consist of one SPL and three SPM's (Total four) for a type 3 SPU; and one SPL with three SPM's (Total Five) for a type 2 SPU, who meet the qualifications laid out in Section 3.

Municipal Resources	Non-municipal Resources	Rate
		<i>All municipalities and contractors will be reimbursed for personnel at the rates below</i>
Fire Fighters		Crew members \$44 per hour worked Crew leaders \$46 per hour worked (Includes wages, overtime, and benefits).
Management Staff		As per actual rates (salary and benefits).
	Specialty Contractors.	As per negotiated contract rates.

6. Safety and Emergency Procedures

WUI fire operations is a high-risk environment subject to the dangers of wildfire entrapment, overhead and slope hazards, vehicle and aircraft operations and medical emergencies. Interface responses add hazards such as vehicle fires, power lines, pressurized gas containers and hazardous materials. Medical emergencies involving responders traveling to and from the fire scene add dangers to which responders must be alert.

At all times during WUI events OHS requirements apply including those for respiratory safety. If conditions on scene are not compliant with OHS requirements all workers must cease operations immediately and evacuate.

During WUI incidents located the IC of the Incident Management Team can direct the immediate stoppage of all structural protection activities and order the evacuation of structural protection personnel.

Responders must approach every situation with a “safety first” attitude. No fire suppression tasks are urgent enough to justify any risk-taking or shortcuts with safe work procedures. All responders to WUI incidents must be competent workers with adequate training and experience. All responders must receive appropriate training from their employer for their respective occupations to ensure safe operations.

It is not the intent of this document to restate existing legislation, policy, or guidelines but rather to identify applicable components of the safety program.

6.1 Safety Guidelines

Legislation

Health and safety in Alberta's workplaces fall under the Occupational Health and Safety Act, Regulation, and Code. The legislation establishes minimum standards for safe and healthy practices in Alberta workplaces.

A "Occupational Health and Safety (OHS) guide for firefighting"⁶ developed by Alberta Labour and MA provides explanations of the OHS Act, Regulation, and Code as they apply to the emergency operations of fire departments in Alberta. This Code of Practice intendeds to deal primarily with the unique work sites commonly known by the emergency services industry as an "emergency scene" and to situations where workers involved in delivering emergency services are responding.

Policy, Standard Operating Guidelines (SOG's), Standard Operating Procedures (SOP's) provide operational guidance to responders on scene. Responders are responsible for following their agency policies and SOG's. Personnel cannot conduct any activity, process or operation in contravention of legislation, their agency policies or SOP's. In the event of multiple organizations working in

⁶ Occupational Health and Safety Guide for Firefighting (2019). *Occupational health and safety information for employers and workers*. Government of Alberta. www.Alberta.ca

cooperation, the most stringent or restrictive policy or SOP applies. Provincial legislation and regulation supersede policies and guidelines.

For incidents within the FPA (outside of cities, towns, villages, and summer villages) the WMB retains all authority over wildfire incidents. Outside the FPA, the local municipality retains its authority. In both instances, all structure protection personnel and operations fall under the direction of the IMT or Unified Command team as appropriate.

Safety Responsibilities

Everyone is responsible for safety in the workplace. All personnel must be familiar and comply with legislation, safety policies and standards. Each organization must have a Safety Policy and Safety Program that shall:

- Ensure the health and safety of all persons on the worksite;
- Ensure that all personnel understands their responsibilities;
- Maintain records of injury and illness; and
- Ensure workers understand the need for and use of PPE.

Each worker shall:

- Protect themselves and other workers;
- Cooperate in all safety matters;
- Report illness and injury; and
- Utilize required PPE.

All workers have the right to refuse work due to imminent danger. In the event of imminent danger supervisory staff must follow the OHS regulations.

Workers Compensation Board Coverage

All persons, municipalities, agencies, commissions, companies, societies and corporations must be registered and in good standing with the WCB.

Written proof of WCB coverage must be provided to MA at the time of initial contracting and verified before deployment.

Emergency Planning

Safety Lists

All responders must be familiar with a range of references to assist in interface response safety awareness including but not limited to:

- Structural Watch-Out Situations.
- LACES – Lookouts, Anchor Points, Communications, Escape Routes, Safety Zones.
- Four Common Denominators of Fatality Wildfires.
- 10 Standard Firefighting Orders.
- 18 Situations that Shout Watch-Out.

PERSONAL PROTECTIVE EQUIPMENT

Personnel working on structural protection assignments shall wear the required legislated protective clothing and equipment. Required minimum PPE includes:

- Fire-Resistant Clothing (Nomex or equivalent);
- Approved Head Protection;
- Approved Eye Protection;
- Approved Hearing Protection;
- Approved Respiratory Protection;
- Gloves; and
- Approved Work (safety) Boots.

Where municipal apparatus and crew are engaged in providing municipal suppression services the following equipment is also required:

- Full Turn-Out Gear; and
- Self-Contained Breathing Apparatus.

Safety Training

All personnel must be made aware of incident-specific safety policies, including:

- WHMIS
- Standard First Aid/CPR Level C
- Emergency response plans & procedures

Safety Briefings

At a minimum, direct supervisors must conduct one daily safety briefing per shift for all crew members. Further safety briefings must take place when tasks or hazards change.

Safety briefings using current WMB forms must be documented and filed with the Branch Director and Operations Chief.

Safety Inspections

Inspections may be conducted by qualified persons on personnel, vehicles, equipment and operations to ensure they are meeting standards established in legislation and policy.

Accident/Incident Reporting

All personnel must report accidents, incidents and near misses to their supervisors. Accidents, incidents and near misses require investigation under the OHS Act and the jurisdiction having authority.

Drugs and Alcohol

The use or possession of illegal drugs, marijuana or alcohol is not permitted at any incident or work site in accordance with Occupational Health & Safety Act. Reporting to work unfit for duty due to abuse of illegal drugs, marijuana or alcohol is not permitted, and personnel doing so are subject to discipline, including removal from the incident.

Workplace Violence

All workers have the responsibility for creating and ensuring a healthy and safe work environment. There is zero tolerance of misconduct, whether it is threats, harassment, bullying or any other inappropriate behavior. All workers are responsible for reporting violence, harassment or inappropriate behavior to their supervisor.

Communications

All SPS's and SPL's are required to have radio communications with supervisors and adjoining forces. Leaders must also have a method of communication to make contact outside of the incident (e.g., cellular phone, satellite phone, radio repeater link to telephone or dispatch).

Heavy Equipment Supervision

It is the responsibility of all personnel to ensure the safe operation of heavy equipment to minimize the risk to people, property and equipment.

Approach Mechanical Equipment in the following manner:

- Stay out of the equipment **DANGER ZONE** areas
- Use radio signals or hand signals for the initial contact
- Establish clear visual contact with the operator before approaching
- The operator ceases operation
- The operator gives the all-clear sign to approach
- Wear PPE.

Motor Vehicle Operation

The operation of motor vehicles must be according to provincial and municipal legislation. Drivers must adhere to the Codes of Practice or SOP for the operation of motor vehicles. Operators must always drive defensively, anticipate dangers, and mitigate hazardous conditions. Operators are required to have their emergency lights activated during the impingement phase.

HAZARDS

Hazard assessments as categorized under the Occupational Health & Safety Act must be identified and mitigated by qualified persons before the entry of emergency response personnel.

6.2 Emergency Procedures

First-Aid Incident

- A first aid incident is a non-disabling injury that does not require medical services and where work time is not lost. It is an incident where the treatment of patients only requires a first-aid kit, or the services of a Paramedic/EMT or the services of a nurse at a nursing station.
- Initiate first aid immediately and then report to your supervisor as soon as possible. Supervisors are responsible for forwarding information through the chain of command. The supervisor is responsible for investigation as soon as possible after a reported incident and for taking necessary corrective measures. Additionally, the supervisor is responsible for ensuring that the first-aid report flows through the chain of command.

Lost Time Incident

- A lost-time incident is a work injury or an industrial disease that requires medical services and prevents the worker from continuing to work or reporting for the next scheduled work shift or workday.
- Initiate first aid immediately and then report to your supervisor as soon as possible. Supervisors are responsible for forwarding the information through the chain of command. The GOA shall ensure that liaisons are assigned as required for the worker(s), families, or hospital.
- Notify the GOA's OHS Contact Centre at 1-866-415-8690 immediately if an injury is severe enough that it may cause a worker to stay in the hospital for more than two days. Workers should not wait for two days to confirm that it is a reportable injury.
- If all information regarding the incident or injury is not immediately available, call in with the available information. Report additional information as soon as it becomes available.
- The supervisor is responsible for investigating as soon as possible after a reported incident and for taking necessary corrective measures.
- Both the worker and the employer have a responsibility to ensure the submission of appropriate forms to the WCB.

Automobile or Mobile Equipment Incident

All automobile and mobile equipment incident losses are reportable incidents. Automobiles include all vehicles licensed for highway use including trailers. Mobile equipment includes all self-propelled equipment such as ATV's, UTV's and heavy equipment.

The Royal Canadian Mounted Police (RCMP) or local police should be notified as soon as possible for incidents that result in injury, third-party injury, property damage and vehicle damage.

Untenable Incident

The first priority for all incidents is the safety of the responders. Safety of responders will not be compromised. In the event the scene becomes untenable, responders have the duty to withdraw from the area until conditions are deemed acceptable by a qualified supervisor within the incident command system (typically the Branch Director or Division/Group Supervisor).

On-Scene Equipment Failure

In the event of significant failure or breakdown of an automobile, mobile equipment or a significant piece of equipment, the operator must report the occasion to their supervisor immediately.

Supervisors must notify through the chain of command if an equipment failure impacts the achievement of assigned objectives and strategies.

Family Emergency

The definition of a family emergency is at the sole discretion of the responder.

Family emergencies may require the immediate attention of a responder, either by telecommunication or by their physical attendance. The supervisor and chain of command shall support the responder in their efforts to address the family emergency and this could include immediate release from the incident and expedited transportation as required.

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7 Program Maintenance and Revision.

MA at this time is responsible for the maintenance of and revisions to the Structure Protection Program including guidelines, contracts, and forms.

7.1 Incident Debriefs and After Action Reviews

Before demobilization and check-out of any provincially-deployed resources from the incident, a formal debriefing must take place.

MA and the requesting organization(s) shall organize and conduct an After Action Review (AAR) for all major incidents. The AAR addresses four key areas, the planning phase, the preparation phase, the operational phase, and follow through on the results.

7.2 Structure Protection Program Operational Guidelines

The Alberta Structure Protection Program Operational Guidelines is reviewed on an annual basis by representatives from MA and the Alberta WMB. Feedback and recommendations from the incident debriefings and AAR's assist with program revisions. The most current edition (2020) of the document is on the MA website.

8. Appendices

APPENDIX I - PERSONNEL ROLES/RESPONSIBILITIES AND KIT LISTS

APPENDIX II - STRUCTURE PROTECTION PROGRAM TEMPLATES

APPENDIX III – SPU INVENTORY GUIDELINE

Archived

Appendix I – Personnel Roles/Responsibilities and Kit Lists

STRUCTURE PROTECTION SPECIALIST (STPS)

STRUCTURE PROTECTION LEADER (STPL)

STRUCTURE PROTECTION MEMBER (STPM)

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Structure Protection Specialist

The Structure Protection Specialist is responsible for the overall coordination and implementation of the structure protection strategies and tactics in the incident action plan.

The Structure Protection Branch Director reports to the Operations Chief, Structure Protection Division/Group Supervisors report to the Branch Director or the Operations Section Chief, and the Structure Protection Specialist reports to the Planning Section Chief.

Roles and Responsibilities

Obtain Briefing from Operations and/or Planning Section Chief.

- Receive incident briefing from Operations and/or Planning Section Chief;
- Obtain the incident action plan, when available; and
- Obtain current situation status.

Provide Input to Operations and/or Planning Section Chief for the Incident Action Plan.

- Formulate tentative values at risk estimates and structure protection strategies and provide these to Operations and/or Planning Section Chief for consideration at the planning meeting;
- Provide structure protection advice to Operations and/or Planning Section Chief for consideration at the planning meeting;
- Attend planning meetings as requested;
- Participate in discussion of incident action plan alternatives; and
- Make sure that logistics support activities are sufficient to support proposed operations within the Branch.

Perform Branch Operational Planning.

- Evaluate threat to values at risk based on current and expected fire behavior;
- Produce values at risk projections using best available techniques and transmit to Planning Section Chief and Situation Unit;
- Complete structure triage assessments;
- Contact utility companies to advise them on structure protection status and existing or potential requirements;

- Establish triggers for commencement of impingement phase strategic procedures and operations;
- Estimate number of resources required to provide adequate structure protection actions and provide to Operations and/or Planning Section Chief for consideration;
- Develop adequate mapping displays for values at risk;
- Develop the Structure Protection Plan and review with Branch resources the following:
 - Strategic procedures, strategies & tactics during pre-impingement, impingement, and post-impingement phases;
 - Resources assigned to each Division/Group/Task Force/Strike Team;
 - Communications procedures;
 - Coordination of procedures between resources and between air and ground units; and
 - Logistics support requirements.
- Complete structure damage assessments when necessary and document all information collected.

Update Branch Planning.

- Determine effectiveness of current Branch operations;
- Review current Branch and Air Operations activities with Division/Group Supervisors;
- Review fire behavior prediction information in the incident action plan;
- Estimate immediate and long-range Branch resource and logistical requirements;
- Compare current capabilities with future requirements;
- Within the scope of the current incident action plan, determine appropriate modifications to current activities and implement; and
- In other than emergency situations, if desired action cannot be accomplished within current incident action plan, recommend to Operations Section Chief changes to current or future plans along with estimates of additional resources required. In an emergency situation, if it is necessary to modify the incident action plan without prior operations approval, take appropriate action and then notify the Operations Section Chief.

Supervise Branch Activities

- Maintain communications with Branch resources;
- Periodically check work progress on tasks assigned to Branch resources;
- Coordinate activities of Branch elements;
- Establish priorities and resolve problems;
- Ensure that Division/Groups are maintaining communications with each other and Air Operations;
- Provide for the safety and welfare of Branch personnel during the entire assignment;
- Recognize potentially hazardous situations;
- Ensure all resources are briefed on potential hazards and safe work procedures;
- Ensure resource check-ins and resource status changes are transmitted to Resources Unit in a timely manner through appropriate channels;
- Ensure resource logistical support requests are coordinated through Branch; and
- Review any accident and medical reports which originate within the Branch.

Report to Operations Section Chief on Branch Activities.

- Notify the Operations Section Chief upon occurrence of the following events:
 - Inability to meet the structure protection objectives of incident action plan;
 - Need to modify incident action plan and additional resources needed;
 - Surplus resources assigned to Branch;
 - Hazardous situations; and
 - Significant events (e.g. injury).
- Provide briefings and updates to Emergency Coordination Centre(s), public meetings, and others as requested by the Operations Section Chief.

Coordinate with Air Operations.

- Determine ground to air communications channel assigned to Air Operations (as applicable);
- Review resource work assignments to determine specific areas or tasks involving direct coordination between ground resource and air operations elements, as appropriate; and
- Maintain communications with Air Operations to ensure effective joint operations.

Maintain & Submit Documentation.

- Collect and transmit all structure protection documentation (plans, maps, logs, photos) to the documentation Unit through Operations Section Chief prior to demobilization.

Structure Protection Specialist (STPS) Kit List

Administration

- Structure Protection Program Templates
 - Structure Protection Resources Daily Time Ticket books
 - Structure Protection Daily Situation Report
 - Structure Protection Plan
 - Structure Damage Assessment
- Stationery Supplies (clipboard/notebook, paper, pens, highlighters, etc.)
- Emergency Response Guidebook
- Community Pre-Plan(s)

Personal Gear

- Fire-Resistant Clothing
- Hardhat
- Boots
- Gloves
- P-100 Filter Mask
- Googles
- Headlamp/Flashlight
- All-weather outer wear
- Clothing/Toiletries
- Tent
- Sleeping bag/foamy

Equipment

- 4WD Pickup truck
- Radio
- Cell phone
- Satellite phone
- GPS
- Digital camera

- Laptop and/or Tablet
- Portable printer
- Battery charger(s)/spare batteries
- Flagging ribbon

Structure Protection Leader

The Structure Protection Leader is responsible for supervising and performing tactical assignments assigned to Structure Protection resources during the pre-impingement and post-impingement phases. This includes provision of reports on work progress and resource status and maintaining work records on assigned personnel.

The Structure Protection Leader may act in the role of Single Resource, Strike Team or Task Force Leader and reports to a Structure Protection Branch Director or Division/Group Supervisor.

Roles and Responsibilities

Obtain Briefing from Supervisor.

- Receive briefing and initial instructions concerning work assignments;
- Obtain the Incident Action Plan and Structure Protection Plan when available; and
- Obtain structure triage information when available.

Plan and Implement Structure Protection Strategies and Tactics.

- Determine and implement structure & site preparation tactics for assigned values at risk; and
- Assign tasks to subordinate personnel.

Monitor Work Progress When Necessary and Make Changes.

- Obtain information concerning progress on assigned tasks from subordinate personnel;
- Compare progress with assignments;
- Ensure general welfare and safety of personnel; and
- Maintain communications with subordinates.

Determine Need for Assistance on Assigned Work Task(s).

- Identify need for assistance, appropriate corrective action, and any additional resources to complete the task; and
- Coordinate with Supervisor and request assistance.

Coordinate Activities with Adjacent Strike Teams/Tasks Forces and Single Resources.

- Identify resources working adjacent to, or coordinating with, Structure Protection from briefings and incident action plan;
- Determine communication channels assigned to adjacent resources from current incident action plan;
- Review assignment to determine specific areas or tasks involving coordination; and
- Maintain communications with adjacent resources.

Submit Situation and Resource Status Information to Supervisor.

- Gather information to include in Situation report by monitoring work progress, personal observations and reports from subordinates;
- Keep Supervisor informed of any significant change in incident or resource status; and
- Inform Supervisor of any location changes within the Division/Group.

Report Special Events (e.g. Accidents, Sickness, etc.)

- Receive reports of events from Structure Protection personnel or personal observation of event;
- Obtain information concerning event by talking to involved personnel or by personal observation related to:
 - Nature of event.
 - Location.
 - Magnitude.
 - Personnel involved (name, organization, etc./do not report names, designators, or organization over the radio).
 - Initial action taken.

- Appropriate subsequent action.
- Request assistance required from the Supervisor or other organizational element as appropriate (e.g. first aid from Medical Unit).

Maintain & Submit Documentation.

Collect and transmit all structure protection documentation (plans, maps, logs, photos) to the documentation Unit through your supervisor prior to demobilization.

Structure Protection Leader Kit List

Administration

- Stationery Supplies (clipboard/notebook, paper, pens, highlighters, etc.)
- Emergency Response Guidebook

Personal Gear

- Turn-Out Gear (Fire Departments only)
- Fire-Resistant Clothing
- Hardhat
- Boots
- Gloves
- P-100 Filter Mask
- Goggles
- Headlamp/Flashlight
- All-weather outer wear
- Clothing/Toiletries
- Tent
- Sleeping bag/foamy

Equipment

- Radio
- Cell phone
- GPS
- Digital camera
- Battery charger(s)/spare batteries

Structure Protection Member

The Structure Protection Member is responsible for performing tactical assignments during the pre-impingement, impingement and post-impingement phases.

The Structure Protection Member reports to a Structure Protection Leader.

Roles and Responsibilities

Obtain a Briefing from Supervisor.

- Receive briefing and instructions concerning work assignments.
- Obtain the Incident Action Plan and/or Structure Protection Plan when available.

Implement Structure Protection Strategies and Tactics.

- Pre-Impingement Phase - Implement structure/site preparation tactics as directed for assigned values at risk.
- Post-Impingement Phase – Provide overhaul/mop-up to impacted structures, conduct hotspot mop-up and extinguishment adjacent to structures, and demobilize all deployed equipment.

Structure Protection Member Kit List

Personal Gear

- Turn-Out Gear (Municipal Fire Departments only)
- Fire-Resistant Clothing
- Hardhat
- Boots

- Gloves
- P-100 Filter Mask
- Goggles
- Headlamp/Flashlight
- All-weather outer wear
- Clothing/Toiletries
- Tent
- Sleeping bag/foamy

Equipment

- Radio (if available)
- Battery charger(s)/spare batteries

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Appendix II – Structure Protection Program Templates

STRUCTURE PROTECTION RESOURCE MANIFEST

STRUCTURE PROTECTION RESOURCES DAILY TIME TICKET

STRUCTURE PROTECTION DAILY SITUATION REPORT

STRUCTURE TRIAGE ASSESSMENT

STRUCTURE PROTECTION PLAN

STRUCTURE DAMAGE ASSESSMENT

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OFC Structure Protection Resource Manifest

To be completed by Resource Provider and submitted to MA.PSDWUI@gov.ab.ca prior to dispatch

Dispatch Date:	
Incident Name/Number:	
AB DLAN Ticket #:	
Resource Provider Name/Location:	
Contact Phone No. and Email:	

Personnel					
#	Last Name	First Name	Position Filled	Cell Phone #	Remarks
1					
2					
3					
4					
5					
6					
7					
8					
9					
10					
11					
12					
13					
14					
15					
16					
17					
18					
19					
20					
21					
22					
23					
24					
25					

Apparatus and Structure Protection Units			
Unit #	Apparatus Kind/Type	SPU Kind/Type	Remarks



Structure Protection Resources Daily Time Ticket

This ticket must be completely filled out and submitted daily

Date:	Incident Number/Name:	AB DLAN Ticket No:
Resource Provider Name:		
Resource Provider Address:		

Resource Provided (Apparatus, Personnel, Equipment, Other)	Start Time	Stop Time	Work Hours	Standby Hours

Work Performed:

Expenses Supplied by:	Meals	Accommodation	Fuel	Consumables	Other (explain in Notes)
Requesting Organization					
Resource Provider					

Notes:

Resource Provider Representative	MA Representative/STPS
Sign:	Sign:
Print:	Print:
Position:	Position:
Phone:	Phone:

Structure Protection Daily Situation Report

Email daily by 09:00 hours to MA.PSDWUI@gov.ab.ca

Incident Information	
Date/Time:	
Incident Name/Number:	
Structure Protection Specialist: (Name/Contact Number)	

Values at Risk		
Value Type	Quantity	Comments
Dwellings		
Infrastructure		
Commercial		
Other		

Resources On-Scene or Enroute			
Resource	On-Scene	Enroute	Total
Apparatus (Engines, Water Tenders)			
Structure Protection Units (SPU)			
Personnel			
Other (Specify)			

Values Protection Strategies and Tactics	
Completed Last Operational Period	Planned for Next Operational Period

Structure Triage Assessment

Incident Information	
Incident Name/Number:	
Structure Name(s) Location (Address/Lat-Long):	
Date Assessed:	
Assessed By: (Name/Position/Contact No)	

Triage Factors	Comments
Firefighter Safety	
Structure Characteristics	
Surrounding Fuels	
Fire Behaviour	
Resources Available	

Triage Category	Not Threatened	Threatened Defensible	Threatened Non-Defensible

Photos and/or Sketch

Structure Protection Plan - Location Name

Value Name	Value Type(s)	Location	Access	Strategic Procedure	Tactics	Resource(s)	Water Source	Hazards / Comments

Communications Plan

Type	Channel No.	Assigned To:
Command		
Tactical - Name		
Tactical - Name		

Structure Protection Organization Chart

Retreat & Return Triggers

Trigger	Action



Structure Damage Assessment

Incident Information	
Incident Name/Number:	
Structure Name(s)/Location:	
Date Damaged:	
Date Assessed:	
Assessed By: (Name/Position/Contact No)	

Damage Assessment Information		
Damaged	Destroyed	Comments

Photos and/or Sketch	

Appendix III – SPU INVENTORY GUIDELINE

SUGGESTED INVENTORY FOR TYPE ONE & TYPE TWO SPU

Category	Item	Description	Unit	Type 2 (All)	Type 3 (All)
Pumps	Mark 3 or BB4 (or equivalent)	High pressure 2 stroke	each	6	2
	Pump Tool Kit	As per contents list on pages 8 - 10	each	6	2
	Hose Strangler	For 1.5"/38mm hose	each	0	0
	2"/51mm Suction hose x 10ft/3.2m	c/w aluminum foot valve & strainer	each	6	2
	Fuel cans	20 or 25 L Gerry cans	each	12	4
	Fuel lines	Single can	each	2 spare & Pump box	1 spare & Pump box
	Extra Fuel lines	Dual fuel line for pumps	each	5	2
	Mix oil	6 Litres (Case) 2 cycle oil	Case(6)	2	1
	Hose	2.5"/64mm diameter	50 ft /15.2m BAT cplgs. 600psi/4200kPa	lengths	20
(BAT = BC/Alberta Thread)	1.5"/38mm diameter lined percolating	100 ft/30.5m QC 300psi/2100kPa	lengths	25	15
(QC = Quick Couple)	1.5"/38mm diameter lined percolating	50 ft/15.2m QC 300psi/2100kPa	lengths	50	25
(GHT = Garden Hose Thread)	Econo 5/8 "/16mm diameter hose	50 ft/15.2m c/w 3/4"/19mm GHT cplgs. 300psi/2100kPa	lengths	150	70
	Econo 5/8 "/16mm diameter hose	30 ft/9.1m c/w 3/4"/19mm GHT cplgs. 300psi/2100kPa	lengths	50	25
	Econo 5/8 "/16mm diameter hose	15 ft/4.6m c/w 3/4"/19mm GHT cplgs. 300psi/2100kPa	lengths	50	25
Nozzles	1.5"/38mm QC	Multi-orifice aluminum 4 in 1 (i.e. Hansen)	#	Pump box	Pump box
	3/4 "/19mm GHT thread	Brass	#	5	0
Valves	1.5"/38mm	3 way QC c/w shutoff	#	30	10

Sprinklers	Butterfly ½"/13mm head	39.5"/1m OAL aluminum pole c/w ¾"/19mm M x F GHT threads (4.3gpm/19.5lpm @ 50psi/345kPa = 26'/7.9m W	heads	30	16
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	Large 1"/25mm	½"/13mm steel dual step spike, brass head, full circle impact (7/32"/5.6mm nozzle, 7.8gpm/35.5lpm @ 50psi/345kPa = 55'/16.8m wetted radius) Or (3/16"/4.8mm nozzle, 5.8gpm/26.4lpm @ 50psi/345kPa = 51'/15.5m wetted radius)	heads	50	25
	Small ½"/13mm	½"/13mm steel dual step spike, brass head, full circle impact (5/32"/4mm nozzle, 4.3gpm/19.5lpm @ 50psi/345kPa = 41'/12.5m wetted radius) Or (7/64"/2.8mm nozzle, 2.0gpm/9.1lpm @ 50psi/345kPa = 36'/11m wetted radius)	heads	50	30
Water thieves	2.5"/64mm M x F BAT thread x 1.5"/38mm QC	Pyrolite	#	15	0
	1.5"/38mm QC x ¾"/19mm male GHT c/w shutoff	Pyrolite or plastic	#	100	50
Adapters					
		2.5"/64mm hydrant gate valve F x M BAT	#	2	0
		2.5"/64mm BAT double female coupling	#	1	0
		2.5"/64mm BAT double male coupling	#	1	0
		2.5"/64mm BAT gated wye	#	1	0

		2.5"/64mm BAT to 1.5"/38mm QC	#	5	2
		Hydrant wrench	#	2	1
	Miscellaneous ¾" /19mm GHT (Econo)	3 way ¾"/19mm GHT individually gated	#	20	20

		¾"/19mm GHT double female adaptor	#	25	10
		1.5"/38mm QC x ¾"/19mm GHT male reducers	#	5	0
		1.5"/38mm QC x ¾"/19mm GHT female increasers	#	5	0
		Washer pack	#	Pump box	Pump box
		¾"/19mm GHT Ball valve shutoffs	#	10	5
Bladders	Portable tank	2500 imp. gal. /11,365L.	#	2	1
For Type 2 & 3	Recommend	Lime green for any new tanks	for	ID	
	Drain valve kit	3"/76mm M to 1.5"/38mm M drain valve assembly c/w shutoff	#	1	1
Ladders	Extension	24 ft/7.3m Grade A	#	1	1
Lighting kit	Generator	2,500 watt	#	1	0
	Fuel can	4 gal/20 litres	#	1	0
	Halogen yard light	Double head c/w stand or sim.	#	2	0
	Extension cord	50 ft/15.2m	#	2	0
	Power bars		#	1	0
FF tools	Shovels		#	1	0
	Pulaskis		#	1	0
	McLeod tool		#	1	0
	Axe	2.5 lb./1.1kg 28"/71cm handle	#	1	0
	Backpack pump	5 gal/22L collapsible	#	1	0
Impact tool kit	Impact driver	c/w case, charger, 2 batteries, bit set	#	2	1
Carpenters tool kit	Tool box		#	2	1
	Tool belt	4 pocket	#	2	1
	Claw hammer		#	2	1
	Pry bar	18"/46cm	#	2	1
	Staple gun	(or hammer) c/w staples	#	2	1
	Pliers	Channel lock 10"/25cm	#	2	1

	Screwdriver	Multi	#	2	1
	Wrench	Crescent 6"/15cm	#	2	1
	Wrench	Crescent 10"/25cm	#	2	1
	Wrench	Pipe 14"/36cm	#	2	1
	Conduit clamps	50 – 3/8"/9.5mm in bag	bag	4	2
	Pipe strapping	rolls	#	1	1
	Tin snips	+/- 10 "/25cm	#	1	1

	Screws	100 – 1 3/4"/44mm	bag	4	2
	Nails	50 – 2 1/2"/64mm duplex	bag	4	2
	Saw	Carpenter hand	#	1	1
	Circular saw, wood	Electric - cordless	#	1	0
Poly	Rolls	200 ft/61m X 6mil	#	2	1
Sign boards	Chloroplast c/w 10 felt marking pens	2 ft/61cm x 2 ft/61cm blank	#	20	5
Tape		Flagging – blue & yellow	Rolls	5	2
		Teflon	Rolls	2	1
		Duct	Rolls	2	1
		Electrical	Rolls	2	1
Rags		Box	Kg.	2	1
Misc. tools					
	Rake	Leaf	#	1	0
	Broom	Push	#	1	0
	Cutters	Bolt 24"/61cm or 36"/91cm	#	1	0
Trailer misc.	Tie downs	15"/38cm bungee cords	#	5	0
		20"/51cm bungee cords	#	5	0
		30"/76cm bungee cords	#	5	0
		Cargo shelf strap 6 ft/1.8m	#	5	0
	Tie down straps	Ratchet	pairs	1	0
Rope	Poly rope -3/8 " /9.5mm	Roll	#	1	1
	Fire extinguisher	5 lb/2.2kg	#	1	0
	First aid kit	Level 1	#	1	0
	Cones	Safety marker 18"/46cm	#	2	0
Chainsaw kit	Chainsaw	Min. 57 cc c/w 20"/51cm bar	#	1	0
	Chainsaw gas can	5 L combi-can	#	1	0
	Chain oil	4 L	#	1	0
	PPE	Chaps, regular	#	1	0

	Tool kit	Bar wrench, grease gun, spare spark plug, chain filing gauge	#	1	0
	Files	Chain & Raker	#	2	0
Manuals	Mark 3, Impact driver, etc.	set	Set	1	1

Type 2 & 3 SPU Pump Tool Box contents:

- 1 Tool box, for storage of following
- 1 Aluminum ball back check valve for discharge side of pump QC
- 1 Spark plug, spare for pump
- 1 Rewind rope, spare for pump
- 1 Mesh wire screen to wrap foot valve
- 1 Water thief 1.5 "/38mm QC to 3/4 "/19mm GHT c/w shutoff
- 1 3/4 "/19mm brass nozzle
- 1 1.5 "/38mm QC 10 ft/3.2m high pressure (450psi/3150kPa) "pony" hose for tandem hookup or first length before back check valve
- 1 1.5"/38mm QC nozzle, 4 in 1 multi-orifice (i.e. Hansen)
- 1 Priming bucket, collapsible
- 1 3 way valve with shutoff 1.5 "/38mm QC
- 1 Mini grease gun for pump
- 1 Tool kit appropriate for pump (consult MFG and need to be listed)
- 1 Hose wrench for suction hose
- 1 Tandem adaptor 2"/51mm F NPSH x 1.5" QC to run 2 pumps in series
- 1 1.5 "/38mm male adaptor NPSH x QC
- 1 1.5 "/38mm female adaptor NPSH x QC
- 1 Single fuel line for pump
- 1 Gasket kit (spares for GHT fittings, pump, suction hose,