



# **Fire Summit 2006**

**Sponsored by  
City of Edmonton,  
Fire Chief Wolsey**

**Facilitated by  
Duffee Management  
Consulting Ltd.**

*From your facilitator, Stephania Duffee*

*The attached document is organized in the following manner.*

- 1. Questions fielded by Bernadine van der Meer, guest speaker from the City of Calgary*
- 2. Input on each issue*
  - A summary of the solutions/recommendations on each issue.*
  - The specific recommendations of each group and all the recorded input from the group flip charts including all recommendations.*
- 3. Ideas from the plenary discussion on how to move forward with these issues.*

*Again, thank you for coming to the Fire Summit. Your participation and input was much appreciated.*

*Stephania Duffee*

**Spatial Separation – Fire Spread Between Houses**  
**– Presentation by Bernadine van der Meer, City of Calgary**

*Brief notes on questions asked of Bernadine.*

1. *How is the City justified in implementing changes before adopted in code?*
2. *Does City support changes to structural requirements when necessary?*

*Answers:*

- Spatial separations of code – tables show no openings below 1.2 metres (assume all houses are 2.4 metres apart), City of Calgary found that tables did not cover new situations and therefore they attempted to create more appropriate tables
- City of Calgary does not support municipalities going off and making their own rules – their approach was simply to address a gap in the table info from the Code. Solution is being used to deal with issue in the meantime – before code is changed.

3. *How does City of Calgary control that window openings are spaced 2m apart horizontally or vertically?*

*Answers:*

- This addresses windows on only one face during 1.5m separation.  
*Comment from the floor: There is one gas shut-off for 500 homes. At NSA conference they introduced a product costing \$8 to put in gas valves below meter and the utility company did not want to install them!*  
*Comment from the floor: Code is clear on fire protection < 1.2 m – you have fire protected walls and no openings are allowed. City of Calgary went off on their own. Similar scenario dealt with in Ontario.*

Are you saying that we should allow no openings? - Bernadine

*Comment from the floor continued... No – saying that Code says what to do at < 8 feet.*

- [Comment of gentleman fr. City of Calgary] we wanted to form a solution – this is part of the development agreement occurring early on in the process. The codes are minimums, when we can produce a product that exceeds the codes, we will...

## **BUILDING SEPARATION AND SPREAD OF FIRE**

### **SOLUTION THEMES Arising from Building Separation Discussion**

(The numbering below denotes # of themes rather than ranking of recommendations.)

#### **1. MAKE BUILDING CODE CHANGES**

- Code process needs to be more streamlined to be responsive to the world today
  - Building codes should have more clarity with respect to what people can or can't do (eg. fire issues, spread, load, "minimum" standards vs. safety?, timeliness)
  - National Building Code needs to look at greater density and built form development to see if regulations are appropriate – go through proper process.
  - Review 0.6-2.0 metre codes relative to combustibility of material and ventilation
  - Property protection and life safety in the code needs to be clarified
  - Quantitative guidelines for combustible/non-combustible sheathing & cladding at limited distance
  - Clarify the definition of limiting distance to account for other structures.
  - Needs to occur in a timely fashion (there is potential for reducing cycle time to 3 years)
  - Improve the relationship b/t Provincial and National building code changes
- Re: Calgary's approach
  - Back Calgary's proposed code changes for the province
  - Influence the National Building Code change as Calgary is doing
- Enforcement of code
  - Municipalities not being allowed to contravene the Alberta Building Code and it must be enforced.
  - Active enforcement of current codes and communication zoning and interpretation of codes within different communities
  - Provincial Intervention – consistency of code application doesn't recognize rural fire response; education and training component; for all levels, homeowners, construction personnel
  - Proper level of enforcement of codes by officials

#### **2. INFORMATION GATHERING & SHARING**

- Statistics Review:
  - Are we collecting right stats?
  - Enhance & increase
  - Better understanding
  - Sharing
- Looking at causes of fire. E.g. storage of household material between homes – these assist and help spread fire

### 3. CHANGE INDUSTRY and BUILDING PRACTICES

- Industry should show initiative by meeting manufacturer recommendations
- Residential sprinkler application
- Non-vented eaves – proper building science
- Exterior drywall be used as per manufacturers' instructions as well going into non-vented soffits, and that all participants are on an equal playing field.
- Fire prevention and fire controls. E.g. sprinklers, fire related walls. Differences between commercial and residential

### 4. CONTINUE THE COMMUNICATION PROCESS WITH ALL STAKEHOLDERS

- Task/risk analysis for fire operations
- More time to discuss the issues
- Multidisciplinary response for managing the issue: eg. codes, on site supervision, inspection

### **Key Recommendations From Each Group & Unedited Input From Flip Charts**

#### **Group A (1,2)**

1. Code process needs to be more streamlined to be responsive to the world today
2. Building codes should have more clarity with respect to what people can or can't do (E.g. fire issues, spread, load, "minimum" standards vs. safety?, timeliness)
  - \* There is a challenge to synthesize this large issue from response time, fire equipment, actual codes, stress, loads, etc.

#### Opinions/discussion

- City of Calgary set up own criteria?
- Large # of fires to neighbors
- Regardless of codes, how/what can be done to address?
- Codes are open/not absolute
- Are we providing enough safety for that window?
- Vinyl siding – with respect to safety distances away (vs. 8' away), what about condos/duplexes?
- Need to collect fire data to make more informed decisions
- Investigate fires for Building Code analysis? Huge task \$/time
- Cause/origin? Is it useful?
- Need info to back up and request changes
- Application of vinyl re: recommended practices – unclear with claim
- Sheathing underneath s/b fire retardant
- Misconception with respect to properties of various products – lumber/OSB – re: burn rates
- Look at alternative for treatment of products to better the materials used – eg. the burn thru rates
- The way fire and building codes intertwined – we may be behind in issues
- Why does it take so long to change national codes?

- Unprotected openings and soffits → issues
- Consider cost of building new homes now

Potential options to resolve issues

- Code process → 3 yr cycle
- Possible annual review
- ICC process
- Provinces and territories need to “sign on” to process
- What about political players?
- Consumers put faith in the process - don’t have knowledge or choice in this regard
- All comes down to reasonable...

**Group B (3,4)**

1. Municipalities not being allowed to contravene the Alberta Building Code and it must be enforced.
2. National Building Code needs to look at greater density and built form development to see if regulations are appropriate – go through proper process.

Opinions/comments

- Would like information on rest of the province / related to trends in separation and lot side
- Size of side-yard has not changed in Edmonton
- Not a new issue
- Varies in jurisdiction how it is being dealt with
- Are most municipalities following current code!
- Too restrictive to not allow municipalities to establish own bylaws to address concerns
- Has to be an even playing field (builders, developer need to know) – across province
- Is code not adequate or people are pushing code?
- Not being enforced (staff/resources)
- Is risk greater now than in the past?
- To increase bylaw will be problematic
  - o Bylaw needs to be consistent
  - o Training knowledge is required by developers
  - o Felt tests were inconclusive (many variables)
- What is the relationship to National Building Code? Rules for changing code?
- Spatial separation has been raised as an issue
- Code needs to be enforced
- Delay in getting new code
- Need even playing field
- Liability concerns
- Intent of code needs to be understood

Potential options to resolve issues

- Taping drywall exterior wall
- Committee – research what is happening in other jurisdictions
- Technical changes need to be made in a formal process (Nationally)
- Municipalities should be allowed to adopt regulations beyond code to reflect needs
- Current rules need to be enforced

### Group C (5,6)

#### 1. Stats Review:

are we collecting right stats?  
enhance & increase  
better understanding  
sharing

#### 2. Back Calgary's proposed code changes for the province

#### Opinions/discussion

- Defined as gypsum sheathing
- Nailable surface has to hit plywood or (?)
- Lack of stats, can this information be collected? (distances, year, type of material)
- Speed of building impacting data collection
- Less regulations for residential
- Fire has no jurisdiction on private homes (storage of materials) → is under fire code
- Clarify the unknowns – educating the committee
- Recognition of Calgary's testing → provincial sharing
- Construction & occupied
- Growth of siding (cost) has impact
- Issues related to stucco
- Clarity of the 15 minutes → 30-45 minutes (?)
- Resources an issue in AB
- Gas value
- Education on understanding and enforcement of the code
- Code is minimum → you can exceed
- Non-vented so fits is a solution
- Cut over hangs → to make a safer home, still have 2 m(?)
- Accept - duplex houses/European model vs single family
  - then create fire walls
  - create row/town homes
  - avoid side yards
- Clarify that foam does not add fuel
- Need testing of various combinations (\$)
- Role of Ottawa in testing → need a concentrated approach
- Industry would also be anxious to do some testing
- Issue of timing for these solutions

- Public education for the consumer. I.e. Safety of the bending consumer in the condo market
- Sprinklers/water damage/insurance stats

#### **Group D (7,8)**

1. Review 0.6-2.0 metre codes relative to combustibility of material and ventilation
2. Industry show initiative by meeting manufacturer recommendations

#### Opinions/discussion

- Key factors
  - o origin of fire
  - o interior and exterior construction
  - o vented soffits
  - o distance between houses and other structures
  - o roofing material
  - o vinyl siding itself is not the issue – it is the material underneath
  - o does the code speak to this? > 5ft different requirements than < 4ft for openings/wall construction
  - o compliance to the code

#### **Group E (9,10)**

1. Follow manufacturers recommendations and have the codes support these manufacturers recommendations
2. Interim amendments to the Alberta Building Codes
3. Update the Fire Services reporting form at the national level to capture critical data

#### Opinions/discussion

- Issues changing
  - o Codes 9yrs old
  - o How current codes keeping up with changes?
- Issue lot lines off the table – not going to talk about changing setbacks
- What about existing buildings to increase safety?
- Understand facts → new products → need to address issues
- Manufacturing recommendations need to be used – research and information
- No one enforcing within codes what manufacturers recommend
- Code doesn't address residential homes adequately with regards to fire  
→ISSUE: does it or not?
- Stats on multi-home fires, at what point in construction or completed homes
- Requirements of stats on fires
  - o Need to ask right questions
  - o National reporting - proscriptive
- Fire reporting
  - o Lacks critical information to do proper analysis
- Code prescriptive



- For O lot lines
- Challenges building outside drywall – issue with labour force not used to this type of construction
- Products – range of material options
- Pressure on building affordable housing
- Code – interpretations to standards
- Codes and manufacturing recommendations and installation instructions NB drywall installed
- Changes to code
- Reinforcement issues

#### Potential Recommendations

- Follow manufacturers recommendations and have the codes support these
- City of Calgary recommendations to codes supported by summit
  - Articulate the issues
  - Generate more support
- Interim amendments to AB Building Code
- Political support Provincially – Move out of national model to provincial model of changes to code (more responsive changes) *group placed an X beside this option*
- Updating fire services reporting form at National

#### **Group F (11,12)**

1. Look at causes of fire. E.g. storage of household material between homes – these assist and help spread fire
2. Fire prevention and fire controls. E.g. sprinklers, fire related walls. Differences between commercial and residential
3. Active enforcement of current codes and communication zoning and interpretation of codes within different communities

#### Opinions/discussion

- Liability & recommended use.
- What is the standard recommendation for vinyl siding application?
- Alberta Building Code – references to 10 min response – 10 or 15 minutes?
- Clarify 10 min response & 5 min set up.
- City of Calgary responding to housing developers – different municipal requirements. Municipal need to reinforce code.
- Multifamily, single family differences
- Problem of trying to increase density
- Streets narrower in new developments
- Narrower lots with larger homes
- Hydrant location
- No discussion on controlling fire within building. E.g. sprinklers, drywall under floor assembly
- How do you cause change to happen?
- Do we wait 10 years?

- Nothing less than 2.4m.

### Group H (13,14)

1. Provincial Intervention – consistency of code application doesn't recognize rural fire response; education and training component; for all levels, homeowners, construction personnel
2. Residential sprinkler application
3. Task/risk analysis for fire operations

#### Opinions/discussion

- Lack of understanding with what fire code actually says and states
- Cultural change in thinking between max and min
- Clarity in specification writing (education needed)
- Best Practice Guide from Federal Partner with private?
- Only one aspect of bigger issue
- No one seems to have "finger on pulse" → provincial body needed? CANADA-wide problem
- Any changes in code costs \$\$
- Political process (education needed)
- Land use, if go down Calgary. Need to require exterior gypsum and interior for < 1.2 m.
- National building code doesn't address protection of FIRST RESP.
- "Adequate" FIRE RESPONSE needs to be defined
- Problems go away with residential sprinklers
- Concern changing building codes at a municipal level
- Is there concern with building CODE PROCESS?
- Benchmarks of large cities versus rural

#### Potential Solutions

- Consistency: PROVINCIAL GOV'T CODE needs to be applied equally across province
- Residential sprinkler (but \$\$!) and insurance?
- Water damage may be an issue
- Rural applications?
- No eaves?
- Manufacturer's requirements with respect to all siding
- Code education
- Clarity of code language

#### Top 5 recommendations

- Exterior noncombustible material (<1.2m)
- Provincial intervention (consistency of code application doesn't recognize rural fire department response)
- Training/education
- Task/risk analysis of fire operations
- Sprinklers for residential

### Group I (15,16)

1. Property protection and life safety in the code needs to be clarified
2. Quantitative guidelines for combustible/non-combustible sheathing & cladding at limited distance
3. Non-vented eaves – proper building science
4. Time for more discussion

#### Opinions/discussion

##### Issue:

- Close proximity
- Materials
- EMS people
- Need Firehall in subdivision in timely manner
- Need to balance risk and affordability
- Reasonable care vs. code interpretations
- Lack of clear/consistent understanding of codes
- Reactive to code change
- During rapid growth, difficult to be proactive
- May need “unique” application of code – e.g. Fort McMurray
- Approach to code: always view public interest 1<sup>st</sup>
- Objective based code approach for issues, not prescriptive
- Performance measurement needs to be clearly explained
- Property line, eaves – problems of code – “silent” or difficult to interpret
- Facts: 12kw fire spread, response time, distance, openings
- Life safety vs. building protection

#### Other Recommendations

- Get away from clustering of openings
- Slow down – developer is responsible to check what's beside
- Review fire response time
- Gas lines

### Group J (17,18)

1. Exterior drywall be used as per manufacturers' instructions as well going into non-vented soffits, and that all participants are on an equal playing field.
2. Clarify the definition of limiting distance to account for other structures.
3. Proper level of enforcement of codes by officials
4. Residential sprinkling

#### Opinions/discussion

##### More time to discuss the issues

- effective fire protection can be achieved relatively inexpensively
- non-vented soffits
- a matter of \$ and ¢
- houses under construction – another issue
- fire spread is not a problem if residential sprinklers

- what would the cost be (sprinklers) to add this in?
- would sprinklers help if fire spreads to the attic
- garage also present problems
- spatial separation is an issue
- builders must all be on the same level playing field
- remove exclusion re: part 9
- municipalities need more resources
- planning departments and developers and fire departments need to work together
- issue: how to stop interior fires spreading
- action requires code change
- side-yard walls only?

**Group K (19,20)**

1. Multidisciplinary response for managing the issue: eg. codes, on site supervision, inspection
2. Influence the National Building Code change as Calgary is doing – needs to occur in a timely fashion (there is potential for reducing cycle time to 3 years)
3. Improve the relationship b/t Provincial and National building code changes

Opinions/discussion

- look at houses under construction
- site supervision issue
- can't keep up with inspections
- municipalities giving into developers
- not in code – won't get done

**\*\*Do we need a short-term fix or a long-term fix?**

## **Engineered Wood Products & Fire Hazards**

### **SOLUTION THEMES Arising from Engineered Wood Products Discussion**

(The numbering below denotes # of themes rather than ranking of recommendations.)

- 1. BETTER RESEARCH** to establish performance standards for individual products.
  - Technical solutions need to be considered based upon their effectiveness (eg. engineered wood products need to be treated, sprinklers, shorten span between flooring and cover with a fire-resistant material like drywall, etc.)
  - Research which is underway needs to be disseminated and considered as soon as possible
  - Engineer out the risk as best as can be done (eg. sprinklers, add fire-retardant materials, etc.)
  - Need statistics to support issue – correct data
  - Establish a performance baseline for time
    - how long is the floor going to stand up
    - system – sprinkler, drywall or other protection
  - Wait for the three year study for empirical evidence (Canadian Wood Council)
  - Look at the structural integrity of the system. For example: 45 minute rating for assembled floor; protecting joints by gypsum and sprinkler systems, test results came under question.
  
- 2. BASE ANY CODE CHANGES ON STATISTICAL DATA and/or RESEARCH**
  - Make building practices based on specific criteria (ie. Fire load over time) and based on science
  - Utilize and share INFORMATION
  
- 3. INFORM AND EDUCATE HOMEOWNERS, BUILDERS AND MANUFACTURERS**
  - On marketplace alternatives and their performance standards.
  - Address disconnects between the fire industry and...land use planning, code regulators, manufacturers of bldg. Products, health & safety industry, home builders.
  
- 4. CODE CHANGES AND BUILDING CHANGES**
  - Regarding best practices, code, and fire safety for families and first responders
  - Update the code to read that all floor joists are protected (could be drywall or sprinkler in the basement)
  - Trusses, 1 beam, lumber needs to be protected in basements and attached garages – either covered with gypsum or sprayed

- Codes need to be enforced.
  - Change code to include provision of fire-protected flooring which could include at least one of the following
    - Application of fire-retardant on engineered I beam
    - Application of gypsum
    - Addition of sprinklers
  - Code to address firefighters as occupants
  - Floor rating in a single-family dwelling (or multi-family dwellings) must be 30 minutes.
  - Any wood joist system should perform to the same fire safety level as a dimensional wood floor
  - Dry-walling or equivalent is seen as the next most feasible/economic solution
- 5. ENGAGE INSURANCE INDUSTRIES** to mandate protective elements (rates, penalties)
- 6. EDUCATION FOR FIRE FIGHTER TRAINING**
- Education of firefighters – use of technologies: E.g. thermal imaging camera
    - Massive voluntary database – different screens that tell the pumper (?)? resist? Info.
    - Use of modern technology for Fire-Fighters.

**Key Recommendations From Each Group**  
**& Unedited Input From Flip Charts**

**Group A (1,2)**

1. Need to deal w/ Performance vs. individual products or material (Material non-protected and protected)
2. There are marketplace alternatives along w/ research that is out there and we should make a point to be aware of this and use some of these ideas to assist in mitigating this issue

**Opinion/discussion**

- Floor trusses – use of commercial atp mt complexes vs. I-joist in residual vs. metal which loses strength in heat
- Burn times – comparing apples and oranges (per handout) E.g. unprotected floor assembly vs. protected
- Research underway relative to topic
- Assemblies – how?
- Issue of protecting the assemblies
- Timeline of events during fire...
- Issue: firefighters and their safety
- People given ample time to exit building in event of fire – no allowance for the time firefighters coming in - Should code look at this?

- Firefighters being trained with respect to what's out there and how to bring awareness of materials - eg. stickers
- Regardless of material...can we look at how to work with what's there?
- If safety is an issue → determine what level of safety is acceptable
- Single family homes don't have regulations with respect to floor rating
- Should we check fire ratings?
- Code not responsive to issue of risk
- Not a materials issue → but safety is the bigger global issue, how do materials play in?
- Regulations should place a level playing field with consistent benchmark for all
- If something can be done to make materials safe, it should be done/action taken
- Frustration → slow movement for action

#### Options to resolve

- Establish benchmarks – what's acceptable
- Code centre directed NRC to investigate issue – with product on market
- There is recognition of urgency to act
- Some research completed but not all
  - o evaluate unprotected systems and products on the market
  - o how to evaluate?
  - o Smoke detectors/alarms
  - o Establish benchmarks
  - o \*time for research can take months – years, depends on complexity
- Why do we allow usage of material before research ok's it?
- Fire ratings – are they part of the code? Yes
- With respect to research: additional tools will be developed to assist in measurement
- New tools to measure always being updated
- Fire needs to have continued input into these issues
- Focus not just on materials but the ENTIRE structure as a whole – floors, walls, etc.
- Structurally sound – being looked at?
- Should consider all the options – research has been done. Product is there to mitigate. Can we adapt? With what other things are out in the industry? There are alternative materials.
- It may be a time and \$ factor
- Political shift – affordability is a huge issue

#### **Group B (3,4)**

1. Technical solutions need to be considered based upon their effectiveness (eg. engineered wood products need to be treated, sprinklers, shorten span between flooring and cover with a fire-resistant material like drywall, etc.)
2. Awareness of products and how they impact on fire-fighting procedures

3. Research which is underway needs to be disseminated and considered as soon as possible

Opinion/discussion

- floor assemblies over basements
- needs to be more specific about which components are being addressed
- awareness of variety of engineered wood products
- questions were raised about which products are more effective during fire – many studies have been completed

Options to resolve

- need to review installation of floor system – is to code of manufacturer specs?
- More in-depth study of technical solutions is needed before the implementation

**Group C (5,6)**

1. Update the code to read that all floor joists are protected (could be drywall or sprinkler in the basement)
2. Massive voluntary database – different screens that tell the pumper (?)? resist? Info
3. Engage Insurance companies to mandate protective elements (rates, penalties)

Opinion/discussion

- clarify "silent floor joist" → should be engineered wood products
- engineered wood joists
  - o independent tests
  - o there isn't clarity re: burn times
- drywall sheathing?!
  - o Re: future development
- There are fire retardant products but they are costly (\$400-\$700)
- No warning (floor sag)
- Testing strength, span – is there testing re: fire?
- There is a video
  - o Fire
  - o Shows independent testing
- Floor sheathing is the problem – NOT an engineered wood product
- Documented system (DATABASE) that alerts firefighters as to content but no right resources to do it
  - o Server
  - o voluntary
  - o Target new buildings
- OSB & I joists → jointly – is the problem
- Deviated from existing code → joists should not be exposed
  - o Drywall the ceiling
  - o Do not leave the joists exposed
- Manufacturer provide an "optional" product



- Explore the "process" of manufacturing
  - o Where could that go within the manufacturing process
  - o Value added

Options to resolve

- Definitions in the code need updating
- Rough screw jobs → not a bad idea
- Isolate the problem by identifying sources (eg. source of ignition)
- Need better stats → from Provincial Database

**Group D (7,8)**

1. Address disconnects between fire industry and land use planning, code regulators, manufacturers of building products, health & safety industry, home builders
2. Engineer out the risk as best as can be done (eg. sprinklers, add fire-retardant materials, etc.)

Opinion/discussion

- performance of engineered wood floor trusses under fire not considered in its design
- code needs to be connected to the second wave of occupancy (firefighters)
- new products need to be tested for worst-case scenarios
- public expects both life and property to be saved; this is a change in thinking

Options to resolve

- build fire protection awareness and change fire fighting strategy and tactics
- code regarding assembly of floor needs to be clarified to avoid misinterpretation

**Group E (9,10)**

1. Trusses, I beam, lumber needs to be protected in basements and attached garages – either covered with gypsum or sprayed
2. Need statistics to support issues – correct data

Opinion/discussion

- common misperception
- lumber joists last up to 30min-60min
- standard fire test typical 10-15mins, total collapse
- fire safety far less than what is thought of
- why are facts different?
- Safety
  - o Advanced warning (sag)
  - o Challenges to see sag – dark, smoke
- Are there manufacturing recommendations for fire safety?
  - o Cover with gypsum
  - o Flame retardant cut fire spread not fire burn through

- Building codes – requirements vary – residential vs. commercial and multi-housing
- Limitation of lumber/ cost and availability, compare to I beam
- Are there similar concerns with attached garages?
- I beams protected
- Basement ceiling and walls protected with drywall
- Garages protected with dry wall
- Spray on insulation (expensive)
- Cost factors for some solutions
- More early warning detection
- Users – homeowners and firefighters to search home
- Usually first floor failures
- Floor joist around for # code cycles – what has happened with this issue?
- Statistics – firefighter risks and injuries

### Group F (11,12)

1. Codes need to be enforced.
2. Look at the structural integrity of the system. For example: 45 minute rating for assembled floor; protecting joints by gypsum and sprinkler systems, test results came under question.
3. Education of firefighters – use of technologies: eg. thermal imaging camera

### Opinion/discussion

- why not spray with a fire retardant?
- Clarify fact vs. fiction
  - o Test data show dimensional lumber times are shorter
- Caution as to identifying building
- No statistics on firefighter injuries
- Are most floors “I” joists?
- We use a thermal imaging camera to determine structural integrity – educate fire fighters
- Differences between volunteer & big-city firefighters
- Gypsum on underside
- Sprinkler in residential construction
- Clearly defining NFPA
- Cost of sprinkler system: \$100/room or \$3,000-4,000/house
- Insurance break for sprinkler
- Fire test numbers are not consistent
- Paints help on flame spread
- Contents drive fire not fuel
- Overall system is more dependent on “I” joists
- How do we address the best way for the future
- Education of firefighters is important

Options to resolve

- Work on definition of engineered products – needs clarity as it includes such a range of product
- Interpretation of codes. E.g. unfinished joists between floors
- Gypping the underside
- Not to be limited to engineered wood
- Structural integrity of system. If the requirements are mostly dimensional it may be different
- Tests do not accurately reflect reality
- System needs to be tested rather than individual components
- Needs to set a performance standard – we have standard in place
- We should be using the code process – needs to be continuous throughout Alberta

**Group H (13,14)**

1. Change code to include provision of fire-protected flooring which could include at least one of the following
  - i) Application of fire-retardant on engineered I beam
  - ii) Application of gypsum
  - iii) Addition of sprinklers
2. Education of homeowners, builders and manufacturers regarding best practices, code, and fire safety for families and first responders
3. Make building practices based on specific criteria (ie. Fire load over time) and based on science

Opinion/discussion

- There are recommendations for installation from Canadian Wood Council (should adopt these)...doesn't single one product out – should be on dimensional lumber
- Failing time is not as large as presented – need to decide what performance criteria is
- Research soon (9mo...) available from NRC
- Good technology, properly applied
- Problem is fire directly applied to system
- Code already maintains any joist system should not be exposed
- Residential versus industrial code different
- Local authorities are stepping up to the plate and enforcing commercially, why not residential?
- Engineered wood not going away
- Smaller buildings need to be protected with same intent as larger
- No requirement for fire separation in res. Homes
- Resistance to drywall beams because of work
- Construction management/inspection issues during construction (of residences)
- Education for best practices (install, occupancy)
- Engineered wood sold as a system

- Need to have fire rated floors, basement → main

Option to resolve

- Change code to change fire protection of floor: include criteria of protection for all residential construction

**Group I (15,16)**

1. Establish a performance baseline for time
  - i. how long is the floor going to stand up
  - ii. system – sprinkler, drywall or other protection
2. Code to address firefighters as occupants
3. Wait for the three year study for empirical evidence (Canadian Wood Council)
4. Education/training of firefighters in code

Opinion/discussion

- flammability of the system (glues, etc.)
- durability
- consistency
- predictability of failure (fire department needs to know)
  - o NO indicators
  - o Time collapse – too quick
  - o Need for empirical evidence
- Timing unprotected → secondary suites impact
- Timing and affordability
- Reasonable time
- Increase use of engineered joists
- Unable to tell the time and the floor material
- Extend the time is the goal

Options to resolve

- Benchmark/equivalency
- Sprinkler or drywall or other protection
- Early detection, enforcement and education of fire safety systems
- Public needs to be informed
- Educate the public about house safety

**Group J (17,18)**

1. Floor rating in a single-family dwelling (or multi-family dwellings) must be 30 minutes. (builders → manufacturers)

Opinion/discussion

- Engineered trusses are a good product, but concern is for firefighters and occupants
- Fire retardant paint (already in code – 2hr rating)
- Attic trusses where exposed have to be protected/joints

- Engineered trusses in residential construction must be manufactured with inherent fire resistance (to same performance as originally in the code) for safety of occupants and firefighters
- Identify homes/dwellings with this material

#### **Group K (19,20)**

1. Any wood joist system should perform to the same fire safety level as a dimensional wood floor
2. Dry-walling or equivalent is seen as the next most feasible/economic solution

#### Opinion/discussion

- assume that basements will be completed
- smoke detectors are now in place
- the code does not seem to be well understood or applied
- the current practice is inconsistent
- new glues being used which give out sooner

#### Options to resolve

- cost/benefit for sprinklers (not cost effective)
- changing the span is not seen as solving the problem
- need for statistics

### **Height of Multi-family Dwellings & Fire Issues**

#### **SOLUTION THEMES Arising from Height of Multi-family Dwellings and Fire Issues Discussion**

(The numbering below denotes # of themes rather than ranking of recommendations.)

##### **1. Building Code Changes, Change Process and Enforcement**

- Ensure consistent definitions with respect to "levels" and "heights"
- Make decisions based on performance not material with respect to criteria. Performance is broader in scope, providing more options
- Municipalities and provincial government should ensure code is being enforced (cost covered through permit fees). Municipalities need to have a quality management plan through Safety Codes Council (higher minimum standard for QMP).
- Tighten up code to reflect the number of floors as related to combustibility
- Require that unoccupied space needs detection and/or protection
- Revise the code to remove ambiguity
- Clarification of the codes provincially
  - create same level of understanding for everyone
  - need to minimize interpretations
  - education component

- Enforce the codes
- Develop the capacity for Alberta to address emergent issues immediately (in addition to going through the NRC)
- Need for greater involvement of fire department in the process – not consistent throughout province
- Sprinklers system for residential 4-plexes
- Sprinkler and standpipng (more standpipng per square metre in code) to all multi-family dwellings (as per American and international standards – 3 family dwelling requires sprinkler)
- Code and firefighters need to work together to develop resolutions
- Define a “story” - define height and level (berm)
  - o baseline height in metres
  - o mathematical codes on heights of building needed in code
  - o diagrams in the code
  - o measure from street
- Clarity applied to code to define “floors” as where fire can spread (include car-parks, crawl spaces) not excluding crawl spaces
- Protection for unprotected areas within a protected building: crawl spaces, lofts, attics.
- Proposed Alberta Building Code change will provide necessary clarity (expected late 2006, early 2007)

## **2. Wait For New Legislation**

- Proposed legislation is addressing this issue (approved for new code change in 2006). Cooperate with code authorities to ensure that builders are building appropriate number of levels (after new changes adopted). This will ensure that sprinkler system regulations are being enforced.

## **3. Training of Officials**

- Associated training of officials required for consistency of application of building code requirements.

## **Top two recommendations and RAW DATA**

### **Group A (1,2)**

1. Ensure consistent definitions with respect to “levels” and “heights”
2. Make decisions based on performance not material with respect to criteria. Performance is broader in scope, providing more options.

### **Opinion/discussion**

- Within the context of combustible construction, we are answering based on material and not performance
- consider every floor level, 4+ = sprinklers installed
  - o below grade included
  - o measuring the same way

- again making decisions based on performance vs. material makes for a level playing field
- How some developers try to fudge rules – needs to be clarified (with respect to Chief)
- Province of Alberta has a directive to deal with
- It is the enforcement of it
- Proposal for upcoming code: there shall not be more than 9 metres between the lowest exit level and the highest occupied floor (limit for combustible construction)
- Exiting requirements
- Municipal bylaw + safety code (supercedes)
- Provincial = senior authority
- Consideration of levels (contained) and stories (of building height) defined, as well as actual height of building
- Requirement of fire services going into these buildings
- Familiarity with buildings and training
- How do we do this, it's very challenging
- "occupied" → what about the mezzanine

#### **Group B (3,4)**

1. Proposed legislation is addressing this issue (approved for new code change in 2006). Cooperate with code authorities to ensure that builders are building appropriate number of levels (after new changes adopted). This will ensure that sprinkler system regulations are being enforced.
2. Municipalities and provincial government should ensure code is being enforced (cost covered through permit fees). Municipalities need to have a quality management plan through Safety Codes Council (higher minimum standard for QMP).

#### Opinion/discussion

- 2006 Alberta building code contains for province (building height limited to 9 metres from lowest exit threshold to floor of height floor occupied) – new code change
- Contamed (?sp?) levels is in code
- Standpipe in residential homes is costly and may never be used

#### **Group C (5,6)**

1. Tighten up code to reflect the number of floors as related to combustibility
2. Require that unoccupied space needs detection and/or protection

#### Opinion/discussion

- Any building over 4 families must be made of non-combustible material
- P120 strobe lights must be in the bedroom
  - Where is this required?
  - Code should be clarified
  - Buildings should be wired for P120

- Should code require enunciation for the apartment upgrade program
- Education requirements for condo association
  - o Drill
  - o Safety lecture
- People are circumventing the code
- Role of condo association if fire (using a school-type approach)
- Enforcement of evacuation plan (no incentive)
- Should code reflect square footage instead?
- Enforce code to only 4 floors
  - o Clarification of establishment of grade -> in relation to curb
  - o Occupancy floors (4)
  - o How many floors are occupied?
- Database
- Limit height on a building that is combustible
  - o Curb height
  - o First principle
- Increase fire assembly between units
- Clarify unoccupied areas
- Fire ratings? Base building/occupancy
- Focus on education
- Thermal imaging

#### **Group D (7,8)**

1. Revise the code to remove ambiguity
2. Develop the capacity for Alberta to address emergent issues immediately (in addition to going through the NRC)

#### Opinion/discussion

- Site grading
- Different communities are interpreting the code and data differently
- Given the length of code change cycle, leaving loose ends to the next cycle is not acceptable
- Regarding issues of urgent public safety, we cannot study the issue for several years before addressing it
- Major flaws in the code revision process – long and cumbersome
- All eggs are in one basket now – need to develop provincial capacity to address emergent issues
- Height is only one factor in the safety of multi-story dwellings → attic space, etc.

#### Options to resolve

- Enhance awareness among compliance people

#### **Group E (9,10)**

2. Clarification of the codes provincially
  - create same level of understanding for everyone



- need to minimize interpretations
  - education component
3. Enforce the codes

Opinion/discussion

- Definition of floors
  - o range of 4-6 floors
  - o height in stories
  - o levels of occupancy
  - o interpretation of code
- Concerns with large condo complexes
- Moved away from intent of codes → taking advantage of codes
- Calgary
  - o Access on slope to aerials
  - o Addressed more specifically
  - o Interpretation
- Abuses of 4-story building definition
- Code/rule there but not being enforced
- Impacts seen on buildings in both Calgary & Edmonton (NB: National standards)
- Address issues of parking stories → parkades

**Group F (11,12)**

1. Need for greater involvement of fire department in the process – not consistent throughout province
2. Sprinklers system for residential 4-plexes
3. Are we focusing on life or structure protection?

Opinion/discussion

- Problem that 4ft berm can be called a story & require no sprinkler
- If it is occupied like a floor it is a floor
- Could be as high as 6 stories with a loft
- New apartments address the issue
- Dry sprinkler system in attics
- Clarify multifamily or row housing (better definitions)
- Trying to close up loop
- NFP 13 & R13
- Part 1x building no sprinklers required
- Fire doors held open
- Zoning for multifamily
- Partial occupancy of 600m<sup>2</sup> – standards are in place
- Compile stats: what works and what does not work
- Protection of life - what is the definition? What is the baseline?
- Mixing concrete with wood construction on top – E.g. commercial on street level & housing on top

- Review on risk basis case-by-case – how to deal with specific structures outside the normal slope
- You could have same structure built in 2 municipalities with different responses
- Inconsistencies – never work with same planner
- Are all inspections done? Drive-by inspections
- Ontario tried to do same plan for all municipalities
- Need for greater involvement for fire department in process – not consistent throughout the province

#### **Group H (13,14)**

1. Sprinkler and standpiping (more standpiping per square metre in code) to all multi-family dwellings (as per American and international standards – 3 family dwelling requires sprinkler)
2. Clarity applied to code to define “floors” as where fire can spread (include car-parks, crawl spaces) not excluding crawl spaces

#### Opinion/discussion

- Fire fighters’ challenge is entrance and getting water to the fire
- Some rural fire departments have no high rise fire fighting training
- Barbecues on balconies and underground parking are issues for fire departments
- Height has been recommended to change already
- Treated same as commercial building
- ie. Multi-family should be treated as commercial
- All multi-family sprinkler
- 4 story single family considered
- Need to protect buildings under construction or renovation
- Early warning detection for crawl spaces
- Non-combustible materials used in firewalls
- Sprinklers and standpipes in code need to be included with wording “occupied floors” (floors that are lived on...) – need to include car parks, HVAC, elevators...)
- Aging communities – are codes sufficient now? (Not?!)
- International standards state that (3 or more) family dwellings need sprinklers
- As long as code process is followed and municipal variations not allowed considering socio demographics

#### **Group I (15,16)**

1. Code and firefighters need to work together to develop resolutions
2. Define a “story” - define height and level (berm)
  - baseline height in metres
  - mathematical codes on heights of building needed in code
  - diagrams in the code
  - measure from street

Opinion/discussion

- 4 story walk-ups
  - o may be 1,2 floors below grade
  - o several floors below grade
  - o floor to ceiling heights vary
- Building height – infinite interpretation
- Height + volume
- Manipulate the berm
- Evacuation
- Fire fighters/fighting
- Institutional buildings
- Code – individual clauses not an integrated approach

Options to resolve

- Integrate all codes that relate to lofts and mezzanines

**Group J (17,18)**

1. Since revisions to the building code will address the height issue (i.e. Greater than 9 metres above exit level requires sprinklers). If indeed that is the case, the issue that emerges is unprotected areas within a building. Thus: the recommendation is protection for unprotected areas within a protected building: crawl spaces, lofts, attics.

Opinion/discussion

- unoccupied spaces protected or non-sprinkled in sprinkled buildings? In combustible buildings?
- Height issue addressed in new code (9m to exit level)
- Emerging issue: conversion of existing buildings
- Standpipes in hallways
- Evacuation of occupants – are building codes taking ageing occupants into account?
- Defend in place in the code?
- Proper instruction for occupants as to what to do
- Evacuation addressed in building code?

**Group K (19,20)**

1. Proposed Alberta Building Code change will provide necessary clarity (expected late 2006, early 2007)
2. Associated training of officials required for consistency of application of building code requirements.

Opinion/discussion

- Lack of clarity in code definition and interpretation of the grade and 1 story
- Designers manipulating code
- Next proposed Alberta code will provide this clarity (9m height) – late 2006, early 2007

## **HOW DO WE MOVE FORWARD TO SECURE A FIRE-SAFE FUTURE**

*(\* questions and comments of the Plenary are italicized)*

### Chief Randy Wolsey's Invitation for Feedback of the Plenary

- We have shared these issues with City Council
  - Thank you all for your response and issues – it has been overwhelming
  - Many industries have been represented
  - Going from group-to-group → heard a genuine concern for public safety, individuals are willing to listen and share unique points of view
  - The code does talk about unacceptable risk to overcome
  - Chief's concerns: technology, boom, lack of capacity to approve and inspect new buildings in a way that ensures the safety
  - Tighter reign on codes, adherence to codes
  - Has heard that this group is supportive of greater enforcement of codes
  - Let's hear about **process** now → how do we implement these solutions to ensure that communities remain safer
1. *Seems like we're addressing solutions, minimizing risk and only looking at building code, but what about: response times, budgets of fire services, public needs to know what their taxes pay for – we're missing part of the picture*

#### Answers:

- Chief Wolsey – Edmonton Fire is working toward achieving response time standards
2. *Ken Knox – Calgary code change is so well written that it will go a long way. In codes there are a lot of people who have great ideas but sometimes they don't translate into a format that will be useful for a long time. One solution is to get code officials some educational parameters on how to forward a code-change proposal in a better way so that it doesn't need to be re-worked, etc.*
  3. *Calgary codes just missed the cycle, so they haven't even been presented yet – that is why they are not adopted – they will be presented at the new cycle → possibly 2009*

#### Answers:

- Chief Wolsey – we can't wait until 2010 because of the building boom. Too many buildings will be at risk.
4. *Timing is important that anyone in this room writes in code change submissions because it will then need to be addressed by working groups at NRC – that will catch the next cycle. Then, follow up and make sure they are addressed.*

5. *Mr. Price: involved in this issue since '99 and it seems that the code is not addressing it. We are in a boom 14,000 residences in Calgary every year. There has to be an interim solution. We can't rely on the code people. What is the issue, facts, recommendation, etc. We should exchange all of our comments and information over the next few weeks. Let's set up a more open sharing of the facts. Then we all need to look at the facts and consider solutions beyond code. Various groups could draft recommendations. Also consider affordability and timing. Let's give ourselves a time limit to comment. Why don't we form a sub-group? Then we can make decisions and draft recommendations and have us re-gather to agree on recommendations.*

Answers:

- Chief Wolsey: There are two things, what I heard is we must focus on the code process and interim code process.

6. *You're on advisory committee to minister – so I think you should bring these comments to the Minister of Municipal Affairs.*

Answers:

- Chief Wolsey: The chair of that committee is in this room today as are other members.

7. *The process today is wonderful – why not simply use the media to bring this specific information to the home-owners so that they can come on board – they'll want to protect themselves.*

Answers:

- Chief Wolsey: That is a high-risk approach because my role is to create a feeling of security within the community and if we went public on some of these issues, the wrong message may get out "we have an unsafe community" – we don't want to cause panic if the media blows things out of proportion
- Our building code for the most part works and some areas need to change.

8. *Bob Thompson – 2010, study, research, scientific data...that's all we've heard today – we're not moving fast enough, by the time we get the changes we need, AB will be built – we'll have 5 years of problems we've created. We should rely on fire experts to ensure that citizens and firefighters are safe. Safety is utmost. This process is moving far too slowly and we will not be able to correct our problems. When we do correct, burden will fall to homeowner. Bylaw can add to code. Through bylaw or agreements with developers, we can get a better product. Supports gentleman who suggested that we form a sub-committee and get moving – next week!*

Answer:

- Chief Wolsey We've made a commitment to supply all the data from today to this group within a few weeks.

- Facilitator, Stephania Duffee - The chief has the list of people attending – so we can connect and get started on developing a process to move forward.
- Chief Wolsey - We haven't provided a list of who was here because of FOIP.
- Facilitator, Stephania Duffee - If you want your name to be disclosed to other participants, indicate that on the green feedback forms in your package.

9. *How do we keep communicating with you?*

Answer:

- Facilitator, Stephania Duffee – We're going to share this information back to you.

10. *Canadian Wood Council, Mr. McPhie – we had good and relevant info discussed, but it is incomplete – in moving forward, is it the intent to seek more info? In the process provincially and nationally it is a consensus approach. Is it a balance of stakeholders today? The group who makes decisions of how to move forward should be a balanced group.*

Answer:

- Chief Wolsey – When I started down this process a number of years ago...I did speak to CWC. I've asked for more information from NRC, but they said they don't have ability to release that information because the research was privately funded. So if anyone has tests and results of tests – RW would love to receive that information and share it with the rest of the group. This is about public safety. Balanced process – RW is of the opinion that the current process is not balanced. Does not think that the fire service has been appropriately represented in regard to interests of fire services and safety of the public. We do favor a balanced process.

11. *Rick Listing – Initial press is jumping to conclusions on products. In press release today are you going to try to balance that out?*

Answer:

- Chief Wolsey – I haven't spoken to the press in 4 mos. They are using old info and footage. Today I will try to avoid discussing products. Instead will give the message that we used the tremendous knowledge of the many people gathered here to work toward moving forward. See press release for a word-for-word statement. If anyone wants to attend press conference to answer to their areas of interest, please do.

12. *Marty MacDonald – how are we going to get this information to code or get the changes implemented sooner*

Answer:

- Chief Wolsey: To do an interim code change, what would we need to do?

13. Chris Tye – *I would agree that it doesn't need to wait to 2010. If code changes are needed, they can be proposed and interim amendments may be passed by an order in council. Challenge is to identify changes that need to be made, provide info on them and alternatives. Once stakeholders have identified changes and agreed upon them, they can be formatted, followed by public consultation and then it can be included in the code.*

### **Closing Remarks and the Next Steps**

- We all have different perspectives, and it's only by coming together and sharing our perspectives that we can make a difference. We must have the best interest of the communities in mind. We will press forward.
- Participants will get the input by the participants of this Fire Summit.
- A report will be drawn up for City Council, and the Department of Community Services.
- Chief Wolsey will be in communication with you about what will happen next.