Summary Report

Demolition Materials Diversion Symposium

Inn at the Quay, New Westminster May 12-13, 1998

Prepared for
DMDS Steering Committee

Prepared by
Dovetail Consulting Inc. &
SALASAN Associates Inc.
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Executive Summary

This report summarizes the results of the Demolition Materials Diversion Symposium (DMDS) held in New Westminster, B.C., May 12-13, 1998. The report has been prepared by Dovetail Consulting Inc. and SALASAN Associates for symposium participants and others with an interest in demolition materials diversion.

Symposium Scope and Objectives

The general purpose of Demolition Materials Diversion Symposium was to bring together key players and sectors involved in the demolition process in B.C. to explore new approaches for increasing the diversion of demolition materials. The intent of the symposium was to engage those most directly involved in the business of demolition in creating a bottom-up strategy, rather than imposing new and potentially cumbersome regulations under a top-down strategy.

The specific objectives of the Demolition Materials Diversion Symposium were to:

- explore de-construction as a possible strategy for achieving both the proper management of hazardous materials and the maximum diversion of building materials from disposal;
- build understanding of how the hazardous components of buildings must be managed in order to minimize impacts on the environment and on worker and public health;
- build awareness of the actual and potential economic value of many building components, and identify the barriers and opportunities for greatly increasing the diversion rate through reuse and recycling; and,
- develop a provincial demolition material diversion strategy that depends on the cooperation of all relevant sectors and describes the involvement of each sector in the demolition process.

Symposium Results

The symposium was attended by over 60 individuals representing a wide range of groups, companies, non-government organizations, and all levels of government. At the conclusion of the event, participants rated the event in written evaluations as “very good” to “excellent” (average score = 4.3/5) and all but one agreed that the event has achieved its stated objectives.

Barriers to Deconstruction

The symposium identified some of the key barriers to deconstruction, including the following:

- lack of awareness of the economic, environmental and social benefits of deconstruction;
- financial disincentives, including tipping fees that permit the disposal of unsorted wastes, and taxation policies that apply to buildings during deconstruction;
- regulatory barriers, including restrictions on the use of recycled materials in building codes, permitting policies and regulations that create incentives for speedy demolition , inconsistent regulations governing the handling and management of hazardous materials, and poor enforcement;
- lack of infrastructure in some regions to support recycling and reuse use, and the lack of market opportunities for the reuse and recycling of salvaged materials, and
- the higher cost resulting from the longer time required, particularly at union rates.

Toward a Deconstruction Strategy: Solutions

Participants at the symposium demonstrated strong support in principle for the deconstruction approach and identified key areas of activity to advance a deconstruction strategy in B.C., including:

- creating enabling regulations that encourage deconstruction by streamlining the permitting process, linking demolition permits to disposal permits, strengthening enforcement to ensure the proper management of hazardous materials, and amending the building code to allow the use of reused lumber and other building materials;
- supporting education, training and outreach to encourage new approaches and link the deconstruction issue to sustainability;
- developing marketing tools and strategies collaboratively with other industry partners; and,
- facilitating coordination and communication among all those interested in deconstruction, in the short term through a multi-sectoral Steering Committee, and over the longer term through the development of an industry association to promote the deconstruction approach and provide a credible voice to speak on behalf of all involved.

Next Steps

Follow-up activities will include the following:

- continued networking and communication among all involved in this initiative through a multi-sectoral Steering Committee, using a variety of informal mechanisms such as e-mail, web sites, and occasional meetings;
- outreach to potential partners through informal meetings and contacts, sector meetings, and presentations to industry associations and groups;
- regional forums to broaden support among a wide range of industries and groups, to identify issues of specific relevance to regions other than the lower Mainland and Southern Vancouver Island (e.g., transportation issues, economies of scale, lack of infrastructure), and to launch specific activities in each region;
- continued efforts to build support for the creation of an deconstruction industry association; and,
- the preparation of materials to communicate and share ideas with potential partners and the general public, such as:
    - a basic education kit, as a first information tool for broad distribution;
    - a more detailed discussion paper for distribution among interested groups and individuals; and,
    - a draft deconstruction strategy document outlining the role to be played by each sector—in consultation with those involved—and clear implementation steps with timeline and tracking / accountability mechanisms to ensure that tasks are completed.

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1. INTRODUCTION

This report summarizes the results of the Demolition Materials Diversion Symposium (DMDS) held in New Westminster, B.C., May 12-13, 1998. The report has been prepared by Dovetail Consulting Inc. and SALASAN Associates for symposium participants and others with an interest in demolition materials diversion (or the deconstruction process).

The symposium was co-sponsored by BC Buildings Corporation (BCBC), BC Environment, Lands and Parks (MELP), BC Housing, Capital Regional District (CRD), Greater Vancouver Regional District (GVRD), and the Recycling Council of British Columbia (RCBC).

The agenda and logistics for the event was organized by a Steering Committee comprised of:

- Craig Crawford, BC Housing;
- Corinne Fulton, Litchfield;
- Brian Grant, MELP;
- Bevin Hodgins, Dale's Salvage;
- Rob Janus, Capital Regional District;
- Michael Masson, BC Buildings Corporation;
- Neil McCreedy, City of Vancouver;
- Thomas Mueller, GVRD; and,
- Denise Taschereau, Recycling Council of BC.

Julian Griggs and Kathy Grant of Dovetail Consulting Inc. and Colin Rankin of SALASAN Associates Inc. coordinated the facilitation and recording of the symposium in support of the Steering Committee.

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2. BACKGROUND

2.1 Origins of the Demolition Materials Diversion Symposium

In the summer of 1997, staff in the solid waste department of the Capital Regional District (CRD) learned at the last minute that the tender for the demolition of three houses and construction of new social housing had no provision for diversion of demolition material from disposal. It appeared that the problem was the standard construction documents used across the country and as a normal condition of financing by BC Housing, which was providing the financing for the project. There was no time to make changes at the last minute, since changes to these documents would likely require a national consensus. As it turned out, the successful contactor did manage to recover some of the most valuable building components on his own.

The CRD's Chief Engineer wrote to Ron Driedger, Director of the Pollution Prevention and Remediation Branch of BC Environment Lands and Parks, asking if the province could bring about the needed changes. In his reply, Ron Driedger suggested that representatives of the CRD, the Greater Vancouver Regional District (GVRD) and the ministry form a committee to organize a symposium on the subject of diversion of demoliton material from disposal.

Brian Grant, Rob Janus and Thomas Mueller met and decided that the committee should be expanded to include representatives from the deconstruction industry and from BC Buildings Corporation and BC Housing. Later on, representation was sought from the City of Vancouver and the Recycling Council of BC. In its first meeting, the steering committee for the Demolition Material Diversion Symposium (DMDS) focussed on defining the problem.

Currently, residential as well as commercial and industrial buildings can be demolished with minimal regard for human health and safety or for the environment. While regulations do exist governing the handling / disposal of hazardous materials and the transportation / disposal of water materials, not all contractors responsible for demolition services abide by these regulations and regulations are inconsistently enforced. As a result, there are concerns for:

- the health and safety of workers involved in demolition;
- environmental impacts on adjacent communities from demolition, transport and incineration of hazardous and waste materials;
- improper disposal of demolition wastes;
- increasing waste streams and demands placed on waste management facilities;
- lost opportunities to recycle and reuse demolition materials, and,
- the competitiveness of those firms that do abide by existing regulations.

Many sectors involved in the demolition process have identified the need for new approaches to demolition and the handling of demolition materials that address these concerns and create a level playing field for all firms. In particular, there is growing interest in approaches that maximize the salvage of recyclable or re-usable materials from demolition. Collectively, these new approaches call for an emphasis on "deconstruction", a process of carefully dismantling a building with the objectives of:

- protecting the environment through proper management of all building components.
- ensuring the health and safety of workers and the public; and,
- maximizing the salvage, recycling and reuse of materials;

The intent of the symposium was to engage those most directly involved in demolition in creating a bottom-up strategy including practical and clear action steps, rather than imposing new and potentially cumbersome regulations under a top-down strategy.

2.2 Participants

Invitations were sent to more than 130 individuals representing a wide variety of groups potentially interested or involved in diversion of demolition materials, including:

- demolition and salvage contractors;
- reuse and recycling firms and restoration contractors;
- environmental consultants;
- local government officials responsible for solid waste management;
- municipal engineers;
- local government officials involved in permitting and licensing for demolition;
- provincial and federal agencies with responsibilities for building codes, worker safety, waste management and environmental protection;
- unions with members involved in the demolition business;
- post-secondary schools potentially interested in offering courses on deconstruction;
- lending institutions, conveyancing firms and realtors;
- architects and engineers; and,
- interest groups and community organizations.

Over 60 people attended the symposium, representing a cross section of most of the above groups. Participants noted that several key sectors were under-represented at

the symposium (including local government officials, and segments of the demolition industry) while there were no representatives from architects, engineers, developers and schools and universities) and suggested to the symposium steering committee that further effort be made to include all relevant interest groups and sectors in any future actions toward developing a demolition materials diversion strategy for British Columbia.

2.3 Definitions

The following definitions of commonly used or emerging terms in the demolition or deconstruction process were provided as a starting point for discussion in the symposium:

deconstruction: taking a building or structure apart in a manner that achieves safe removal and disposal of hazardous materials and maximum salvage and recycling of materials;

demolition: the rapid destruction of a building after removal of hazardous materials;

demolition permit: an authorization issued by a local government for removing a building or structure;

disposal: the introduction into the environment of materials that have no reuse or recycling potential for the purpose of final burial or destruction by fire;

environmental assessment: a survey by a qualified professional of a building slated for deconstruction or demolition, for the purpose of identifying the presence of hazardous materials;

hazardous material: a material that meets the definition of special waste in the Special Waste Regulation and requires disposal separate from ordinary refuse;

recycling: the collection and processing of materials that are no longer useful in their present form, and the subsequent use of their material content in the manufacture of new products for which there is an existing market;

reuse: at least one further use of a product or material in the same form but not necessarily for the same use; and,

salvage: the recovery of materials from a building and site for the purpose of reuse.

3. SYMPOSIUM OVERVIEW

3.1 Symposium Objectives

The objectives of the Demolition Materials Diversion Symposium were to:

- explore de-construction as a possible strategy for achieving both the proper management of hazardous materials and the maximum diversion of building materials from disposal;
- build understanding of how the hazardous components of buildings must be managed in order to minimize impacts on the environment and on worker and public health;
- build awareness of the actual and potential economic value of many building components, and identify the barriers and opportunities for greatly increasing the diversion rate through reuse and recycling; and,
- develop a provincial demolition material diversion strategy that depends on the cooperation of all relevant sectors and describes the involvement of each sector in the demolition process.

3.2 Anticipated Outcomes

At the conclusion of the symposium, it was hoped that participants would have:

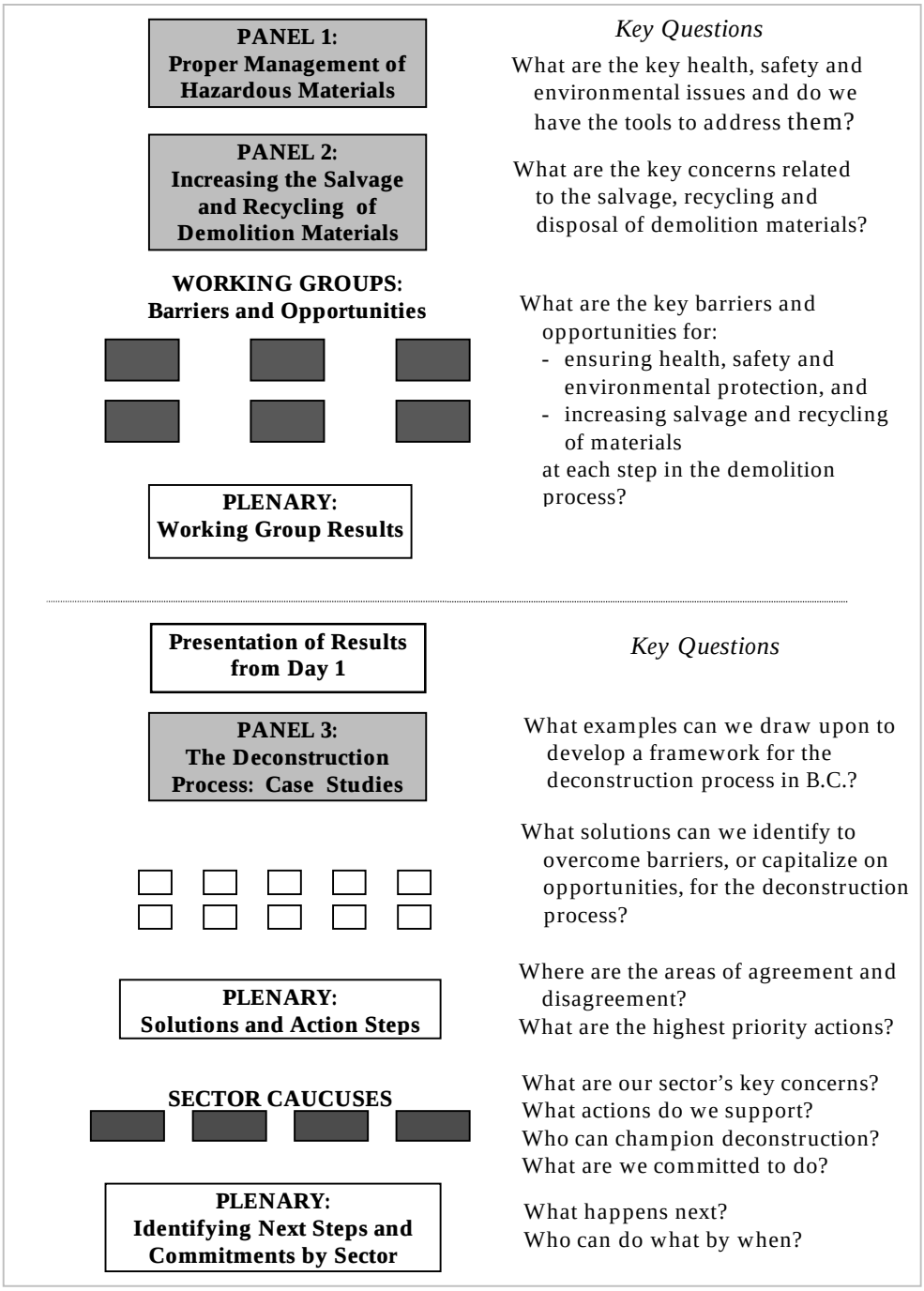
- a clear understanding of the existing regulations governing the demolition process, particularly the proper assessment, handling and disposal of hazardous materials;
- an increased understanding of current issues and concerns regarding health and safety, environmental impact, and the salvage and disposal of demolition materials;
- identified specific and practical solutions for increasing demolition materials diversion, including:
    - examples, blueprints and other tools that demonstrate practical approaches to demolition materials diversion (e.g., permitting blueprints, sample tendering contracts);
    - specific and immediate steps to be taken (e.g., liaison and outreach with sector groups) with respect to the various aspects of demolition materials diversion (e.g., handling of hazardous materials, salvage, recycling, disposal);

  - common points of agreement for defining a demolition materials diversion strategy for BC;
  - a steering committee that includes representatives of all key sector groups to move forward following the workshop; and,
- made specific commitments to collaborate in the development of a made-in-BC strategy for all steps in the deconstruction process.

Follow-up actions discussed at the symposium considered further means for involving the various sectors with an interest in deconstruction in development of a demolition materials diversion strategy, with coordination and guidance to be provided by a multi-sector Steering Committee building on the membership and interest of the steering committee for the symposium (see Section 6.1).

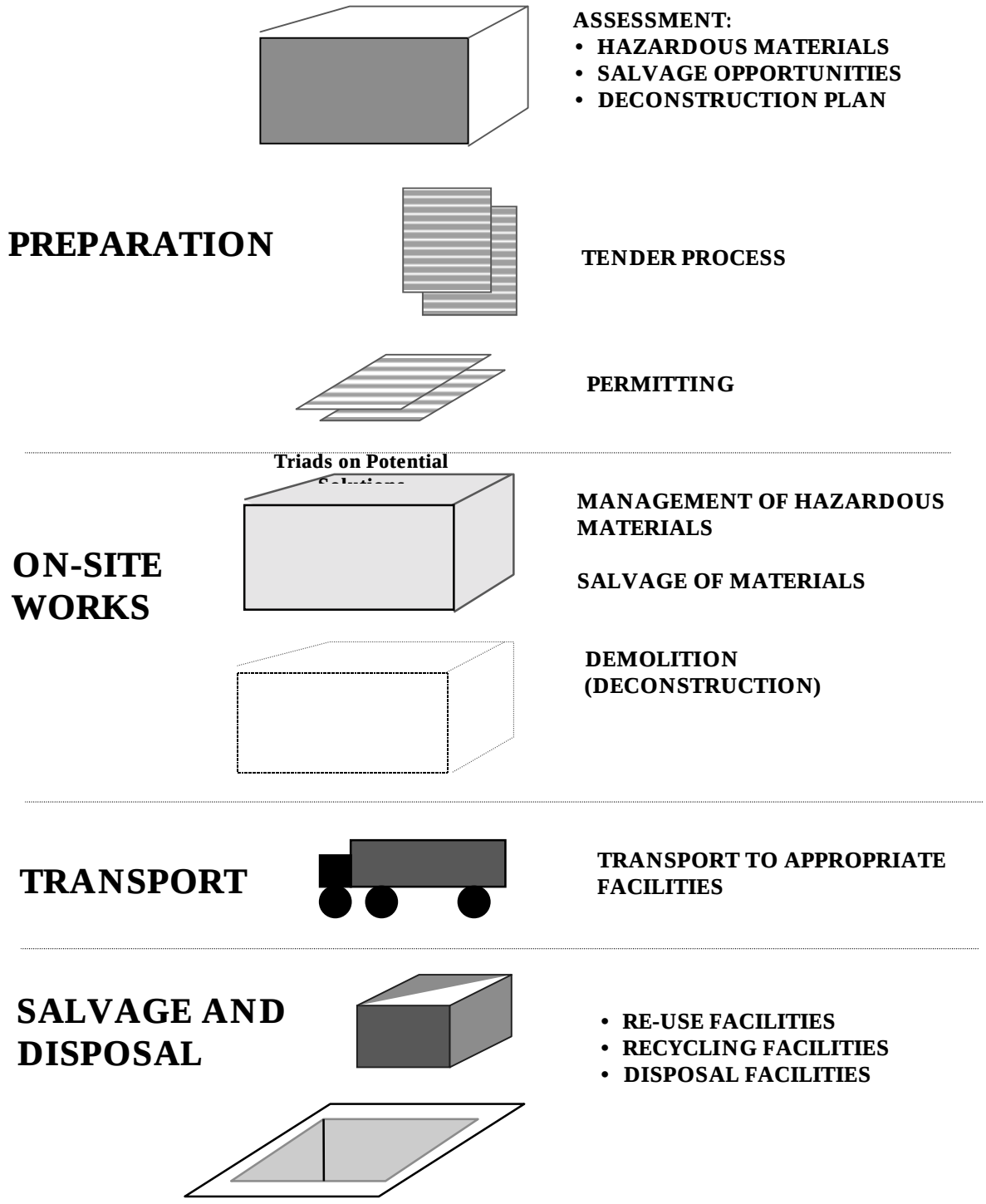
3.3 Agenda Overview and Discussion Framework

The discussion framework for the symposium and the flow of the agenda is presented in the diagram below.



3.4 Key Steps in the Deconstruction Process

The diagram below outlines some of the key steps involved in the deconstruction process and was used in support of symposium discussions.



4. SUMMARY OF PRESENTATIONS

4.1 Keynote Address

Ron Driedger, Director, Pollution Prevention and Remediation Branch, Ministry of Environment, Lands and Parks

Ron Driedger remarked on the ambitious schedule of the symposium and noted excitement within the Ministry about trying something different. He spoke about the Ministry's move away from the command- and- control strategies and towards voluntary compliance and industry stewardship programs, either voluntary or mandated by regulation. Mr. Driedger cited examples of both types of stewardship programs. He also explained that, because of the nature of demolition refuse (i.e., a wide variety of materials) and the nature of the industry (i.e., many different players with different functions), the industry does not lend itself to an industry stewardship regulation.

Mr. Driedger noted that an innovative approach and a new attitude is required in working with the demolition industry. He suggested that the start of this new attitude is changing the name from *demolition* to *deconstruction*: "We want deconstruction to be the norm and demolition to be the special case. To do this we need greater cooperation towards change by each sector involved in materials diversion." Deconstruction should ensure that hazardous materials are taken care of, and valuable materials are reused and recycled. Mr. Driedger listed several further benefits of deconstruction (reduced landfill volumes, less illegal dumping, and increased availability of high quality used building materials), and noted the importance of deconstruction in meeting the provincial goal of reducing per capita waste disposal by 50% by the year 2000.

After encouraging participants to craft an "action-based strategy" and "make this symposium a forum for real change," Mr. Driedger ended his keynote address with a parable in which mice, who wanted to outsmart a silent-footed cat, devised a plan which would alert them to the cat's approach: The mice proposed to put a bell around the cat's neck. Unfortunately, the mice neglected to consider the impossibility of the practical task of placing the bell around the cat's neck. Mr. Driedger cautioned that it is easy to propose unrealistic possibilities and encouraged symposium participants to bring their collective experience to bear on the subject of demolition materials diversion in a manner which supports practical and progressive action.

4.2 Panel Presentations

4.2.1 Panel 1: Proper Management of Hazardous Materials

Kul Bindra (MELP)—Special Waste Regulation

Kul Bindra began his presentation by describing special wastes. He clarified that special wastes are the same as hazardous wastes or dangerous goods as defined by the Transportation of Dangerous Goods Regulation. He gave a number of examples of things which are considered special wastes, e.g., abandoned drums and sacks of dangerous materials; left-over cans of paint, oily materials, pesticides, PCBs, acids and alkalis; materials containing asbestos in friable form or more than 1% asbestos, and of things which are not, e.g., asphalt and tar from driveways, used treated wood, and insulation materials. Mr. Bindra cautioned that even though the latter materials are not considered special wastes, their disposal is still subject to the provisions of the Waste Management Act: "You cannot throw them just anywhere!"

Mr. Bindra stated that the purpose of the Special Waste Regulation is to protect human health and the environment by controlling handling, storage, transportation, treatment, and disposal of special wastes. He gave a brief overview of the nine parts of the regulation: (1) interpretation and application; (2) minimum sitting standards for all special waste facilities; (3) operational requirements; (4) specific requirements for different types of facilities; (5) prohibited management practices; (6) management of specific special waste types; (7) administrative requirements; (8) containers for special waste; and (8) specific exemptions. Mr. Bindra noted that the emphasis of responsibility is on the generator of the waste material; however, anyone who is in possession of hazardous materials is equally responsible. He invited symposium participants to obtain copies of the regulations through Crown Publications at (250) 386-4636.

Michael Quigley (WCB)—Worker Health and Safety Concerns

Michael Quigley introduced the new Occupational Health and Safety Regulation and spoke about how this regulation will impact demolition / deconstruction projects. Mr. Quigley described how the regulation, which came into effect on April 15, 1998, was developed through a collaborative effort of workers and employers to replace the previous Industrial Health and Safety Regulations. The new regulation is a collective document with 33 parts which are further broken down into sections (about 4300 sections in total compared to the 4000 old regulations). One third of the sections are unchanged, one third are modified, and one third are new.

Mr. Quigley discussed three changes of special interest to the demolition / deconstruction industry:

- Notice of Project requirements apply to situations of asbestos removal and abatement projects, lead abatement projects involving disturbance of coatings, and similar activities exposing workers to risk of occupational disease;
- structural integrity requirements apply to systematic demolition methods which may compromise structure or adjoining structures, and require support systems prescribed by a professional engineer and that the plan must be on site; and,
- with respect to hazardous materials, inspections must be done prior to the project going ahead to identify hazardous materials on the premises and to ensure their proper removal.

In summary, Mr. Quigley emphasized that the WCB does not want to dissuade the industry from deconstruction; the Board will work with other interested parties to ensure that assessment of health hazards and abatement of risk are part of the deconstruction process. The ultimate goal of the Board is to ensure that workers are not placed in the line of fire of hazards on the jobsite.

Peter Hansen (PECOHS)—Environmental Assessment

Peter Hansen began his talk by saying he was "here to cause controversy—to try to balance the needs of an owner and a strict budget with all the requirements; this is not an easy job!" He noted that there are two regulatory agencies which have to be satisfied in environmental assessments: WCB, and Ministry of Environment, Lands and Parks. Mr. Hansen explained that there are conflicts between the two sets of regulations due to their different objectives. Using the example of asbestos, he described how the Ministry is only concerned if there is more than 1% asbestos in a friable product, whereas the WCB is concerned with any material containing more than 1%.

Mr. Hansen stated that the costs of complying with the WCB regulations (which are the toughest of any regulating agency in the world) are staggering. Using the example of asbestos again, he noted that some gypsum wallboard is contaminated with asbestos in the taping mud. If the mud and the wallboard were considered as a single product, the amount of asbestos would be well below the 1% level and the wallboard could therefore be recycled. Instead, WCB considers the asbestos separately, with the result that huge quantities of wallboard must be trucked to special landfills in the U.S. or Alberta at high cost to owners. He also noted that there is a disparity between what is accepted at different landfills and stated that the government must ensure that landfills know what they can and cannot accept and apply the rules consistently.

Jeff Westeinde (Quantum)—Abatement of Hazardous Materials

Jeff Westeinde opened his presentation by concurring with Peter Hansen's remarks about conflicts between different regulating bodies and the need to reconcile differences in interpretation in a consistent manner. His presentation then outlined the work of environmental contractors in hazardous materials abatement in two categories: ground contaminants, and building contaminants. Mr. Westeinde showed a number of slides to illustrate the types of work his company does (e.g., clean-up and remediation of contaminated soil or water; removal of underground storage tanks; asbestos removal; lead paint removal). He noted that the most difficult cases to undertake are those which involve both human health and environmental concerns (e.g., blasting paint off a bridge over a salmon bearing stream), with a need to protect both workers and the environment. He described the standard protection for workers (gloves, suits, respirators, etc.) and explained decontamination processes for both materials and workers (e.g., showers). Mr. Westeinde ended his presentation by emphasizing that a contractor's primary role is to handle hazardous wastes based on what the regulators predict is safe or not safe.

4.2.2 Panel 2: Increasing the Salvage and Recycling of Demolition Materials

Mike Stringer (GVRD)—Illegal Dumping

Mike Stringer talked about some of the problems than can result when demolition material is not salvaged, recycled or disposed of in the approved manner. He used slides to illustrate five types of illegal dumping: (1) random dumping (e.g., single loads dumped off logging roads or cul-de-sacs); (2) abandoned waste (e.g., a facility which collects large amounts of material under the false pretense of recycling); (3) unauthorized landfills; (4) accidental (e.g., waste falling from a truck); and (5) disposal of readily recyclable material (not against the law, but against policy). Mr. Stringer stated that although illegal dumping occurs primarily to avoid tipping fees for disposal or recycling, it might also occur due to inconvenience (i.e., timing and location of facilities), carelessness, or suspicion of contamination (i.e., cases in which legitimate landfills don't want to take the waste).

Mr. Stringer described a number of dangers and concerns associated with illegal dumping, including health and safety concerns (e.g., unstable debris piles, breeding grounds for rats), fire hazards, environmental problems (e.g., habitat destruction, water pollution, air quality), aesthetic problems, and the loss of resources (e.g., metal or cardboard for recycling). He said that despite a number of regulations and acts prohibiting illegal dumping (e.g., Federal Fisheries Act, Provincial Waste Management Act, Special Waste Regulations, Regional and Municipal By-laws), it is almost impossible to prosecute offenses unless people are caught in the act. He cautioned that since property owners, facility operators, haulers, waste generators, contractors and

sub-contractors could all be held responsible for illegal dumping, it is very important to know your hauler and visit the dump sites.

Corinne Fulton (Litchfield & Co. Ltd)—The Deconstruction Process

Corinne Fulton discussed some of the experiences and techniques of her deconstruction company over the past 20 years. She described four components of the deconstruction process: abatement, salvage, recycling, and disposal. She used slides of case studies (a 17-building industrial site, the Armories Building at U.B.C., and the display barn site at Hastings Park) to illustrate a number of techniques used, and the types of material salvaged by her company. Some of the materials salvaged for reuse or recycling included: trusses, joists, concrete and metal for recycling, lumber, catwalks, and electrical equipment. She estimated that only 20% of the material from these case studies went to landfills.

Ms. Fulton listed several obstacles her company has faced in the deconstruction of buildings: (1) time pressures to demolish buildings; (2) lack of space for sorting and storing salvaged materials, especially in downtown areas; (3) union labour costs can make deconstruction not cost-effective; (4) an unlevel playing field in which it is beneficial not to follow rules, such as the removal of hazardous and / or banned materials; (6) the B.C. Building Code which doesn't allow the use of many salvageable materials; and (7) lack of awareness within the industry of the benefits of deconstruction. She closed her presentation by identifying potential benefits of deconstruction: job creation, material diversion from landfills, creation of high quality building materials (e.g., first growth timber which may be costly or difficult to obtain other than from deconstruction), and preservation of natural resources.

Thomas Mueller (GVRD)—Waste Reduction Implications

In his presentation, Thomas Mueller outlined reasons for the GVRD's interest in construction and demolition and then talked about the GVRD's "3Rs Code of Practice for the Building Industry". Mr. Mueller noted that one third of all the waste generated in the GVRD comes from the construction and demolition industries. He said that although industry has come along way in its recycling of concrete, asphalt, and drywall (e.g., 80-90% of asphalt and concrete and 94% of drywall) a lot more could be done to reduce wastes. He estimates that 80% of demolitions are residential and the other 20% commercial. While most commercial sites include a large salvage and recycling component, less than half of the residential sites include any level of salvage, and this is often limited to the most valuable and easily accessible architectural components and teak flooring. Mr. Mueller felt that the dominant driver determining the extent of salvage at sites is economic (cost of salvage and potential return from known salvage markets, e.g., from metals).

Mr. Mueller said the 3Rs Code of Practice developed by the GVRD focuses on raising awareness and voluntary compliance. He noted the need to increase public education

and to make case studies available to show the economic benefits of deconstruction. He described two main recommendations of the code which are relevant for demolition projects: (1) plan your program (look at your disposal needs and the types of wastes you produce at each project site); (2) recycle (separate concrete, asphalt, clean wood and scrap metal for recycling at demolition and renovation sites and (3) reuse (salvage reusable materials from buildings during demolition and renovation). He provided a long list of material that had been salvaged from one single family home (windows, patio sliders, doors, oak stair treads, etc.). Mr. Mueller concluded his presentation with the hope that the GVRD will have opportunities to work with the demolition sector in reducing wastes in the future.

Peter Sweeney (City of Vancouver)—Building Codes/Demolition Permits

Peter Sweeney's presentation centered around Vancouver's zoning and development by-laws and how they impact the building and demolition permitting process. He explained that one of the main restrictions on obtaining a demolition permit comes into effect if the property was previously used as rental property. In this case, there is a restriction on demolition until a building permit for new development is in place.

Mr. Sweeney described key by-laws and other policies related to deconstruction / demolition in the City of Vancouver: (1) building by-law; (2) heritage by-law (protects listed buildings until they have been reviewed by staff); (3) private property tree by-law (protects significant trees); un-tidy premises by-law (allows city staff to order clean-ups); (4) housing strategy (presently indicating a desire to retain sufficient rental housing); (5) good neighbour policy (limits hours of work, protects public); and (6) vacant buildings and neighbourhood stress (the city can exempt vacant buildings from the building permit requirement and allow them to be removed if there are unsafe conditions or problems identified by neighbours). He noted that there are a limited number of staff to carry out the work involved in implementing these by-laws.

4.2.3 Panel 3: The Deconstruction Process—Case Studies

Jeff Westeinde (Quantum)—Environmental Assessment/HazMat Abatement

Jeff Westeinde spoke about the three phases of an environmental assessment. He said that Phase 1 is comprised of an historical review through which possible hazards are defined, and a review of previous site uses is undertaken. He described Phase 2 as a detailed site investigation in which a list of building contaminants is prepared, sampling is conducted, and a site remediation plan is developed. Phase 3 is where the remediation plan is implemented and haz-mat abatement takes place.

Mr. Westeinde used the decommissioning of a former steel manufacturing and zinc galvanizing plant in Vancouver as a case study. He said that in Phase 1, asbestos, hydrocarbon contamination, and the presence of PCBs (electrical equipment) and CFCs

(air conditioning units) were noted. In Phase 2, a detailed description of the contaminant's locations were prepared, and various consultants were retained to deal with these contaminants. Mr. Westeinde said he was involved in Phase 3: project planning and developing work procedures; examining the building envelope and looking at possible contamination pathways to the exterior; pulling out a contaminated floor, replacing the floor and putting in drains; decontaminating bricks and concrete on site; and processing zinc contaminated materials. He stated that political will was critical to the success of this project, as it provided for a sufficient project schedule to allow for innovative methods of handling hazardous wastes.

Bevin Hodgins (Dale's Salvage)—Deconstruction: Economic Benefits

Bevin Hodgins spoke about turning deconstruction projects into "little mines"—trying to sell everything rather than disposing of it. Using the identification and cultivation of cottage industry markets for deconstruction materials as an example, he identified several benefits to society of deconstructing (i.e., not using an excavator to demolish) small buildings: (1) enough revenue in one house to offset 200-300 man hours of work; (2) valuable material is not wasted; (3) less property damage; (4) less damage to remaining buildings; and (5) money goes back to society through wages, both in deconstruction and related cottage industries

Mr. Hodgins reviewed several value-added industries that have built-up around the use of salvaged materials (e.g., flooring, furniture, sheds, laminated beams, fencing , firewood, wood for cement forming, and scrap metal). He believed that the number of jobs in these industries is potentially more significant than in the deconstruction industry. He echoed the message of other speakers, saying that the playing field needs to be leveled: everyone should pay the same price for tipping, and recyclers and reusers should not be penalized with higher costs when they are adding value to society.

Ron de Vries (Defense Construction Canada)—Deconstruction: Competitive Tendering Process

Ron de Vries gave a brief overview of DCC's interests in deconstruction before describing DCC's competitive tendering process. He said that under the Department of National Defense's sustainable development strategy, the department agreed to a 50% decrease in waste production, green construction and renovations practices and energy conservation measures for the year 2000. The tendering process has been developed to support these goals. Mr. de Vries described some of the pre-bid activities: identifying groups interested in deconstruction; soliciting groups who may not be tied into the open-tender system; environmental assessment processes; and determining schedules and funding (ensuring adequate time and space to do a project).

In the actual tendering process, he said that proposals are requested in two separate parts: a price proposal and a technical proposal. The technical proposal is evaluated using a matrix which gives a score based on percent of reuse and recycling (reuse is weighted higher than recycling). He said that there is also a qualitative component to

the evaluation in which the methods of reuse are examined and points may be given to encourage innovative ideas. Mr. de Vries noted that price does still play a part in awarding contracts: they accept the contract with the most points that is not more than 10% more than the lowest bid. He closed his presentation by handing out copies of DCC's *Proposal Preparation and Submission Instructions* (see Appendices). He noted that DCC is still learning how to make the process better and welcomed suggestions from participants.

Corinne Fulton (Litchfield Salvage) and Thomas Mueller (GVRD)—Markets and End Uses for Salvaged Materials

Corinne Fulton and Thomas Mueller reviewed a number of specific examples of reuse and recycling of salvaged wood, concrete, asphalt, metals and other materials. Through slides of case studies, they showed the end uses of various salvaged materials. Examples included salvaging tongue and groove flooring from a site at the PNE and reusing it in Earl's Restaurant on Kingsway; frames and trims in high-end houses with salvaged lumber; gym flooring reused for floors in Ms. Fulton's store; reusing trusses from the Armories Building at U.B.C. in the C.K. Choi Building; wood salvaging for chipping; reusing bricks for pathways; concrete broken-up and reused for road beds; reuse of metal materials such as catwalks and I-beams; and recycling of stripped drywall.

Ms. Fulton and Mr. Mueller identified some of the barriers to developing markets for salvaged materials: BC Building Code not allowing reuse, high labour costs for preparing materials, lack of consistent supply, negative perception of used materials, and low availability. They also restated some of the benefits of deconstruction: job creation, salvage of high quality materials, and conservation of natural resources.

5. SUMMARY OF WORKING GROUP RESULTS

5.1 Barriers and Opportunities for Increasing Salvage and Recycling

During the first day of the symposium, working groups were formed to address barriers and opportunities for increasing salvage and recycling for each of the key steps in the deconstruction process: preparation, on-site works, and transport, salvage and disposal (see Section 3.3)

Actual discussion in the working groups and results presented in plenary sessions addressed barriers and opportunities in terms of general issue areas rather than by steps in the deconstruction process. Thus, working group results are presented in term of these issue areas, with reference to specific steps in the deconstruction process only where identified by the working group. Participants in the working groups pointed out the inter-connected nature of many of the barriers facing deconstruction—thus, points may apply to several issue areas.

These results are a summary of working group and plenary discussions, often stated in point form to reflect the nature of the discussion. Those wishing to review the original data may arrange to do so by contacting the Chair of the DMDS steering group.

5.1.1 Lack of Awareness

Lack of awareness of both the true costs of present demolition practices and the real and potential benefits of a deconstruction approach is a key barrier to the diversion of demolition materials. This lack of awareness extends through most, if not all, of the sectors presently involved in the demolition of structures—industry contractors and consultants, government regulators, and members of the general public.

There is distrust about the quality of demolition materials and their suitability for reuse among both the public and industry interests (e.g., contractors, architects, engineers, developers).

Among the public, education and awareness raising is essential to create demand and stimulate new markets by tackling the following attitudes:

- salvaged materials have a negative public image—people prefer new and clean products;

- lack of awareness of the potential cost savings and economic opportunities means that deconstruction is not yet viewed as a good thing on a scale equivalent to household recycling programs; and,
- neighbourhoods may still view the time needed for deconstructing a structure as a stress rather than as a benefit.

Within the industry, similar challenges are present:

- many groups have established ways of doing business which are viewed as easier or less complex than deconstruction and remain largely unaware of the benefits of salvage and recycling of materials as a means to offset costs—a "wrecking ball" mentality still prevails'; and,
- many involved in the industry are aware of applicable hazardous materials and demolition bylaws and regulations but not all comply.

Owners and contractors may therefore need to see—first hand—the benefits of deconstruction before adopting deconstruction practices. Contractors, developers and owners also need to be educated about the liability issues surrounding improper disposal of materials and their role in ensuring proper transport and disposal of materials.

5.1.2 Inadequate Regulatory Framework

Regulatory Barriers to the Reuse of Materials

- Current regulations (e.g., Building Codes) may not permit the reuse of materials;
- Reuse of lumber in the construction of permitted buildings involves re-grading and additional costs.
- Regulators are not familiar with how to address the reuse of materials in new buildings, leading to delays and difficulties for those attempting to do so.
- There are no regulatory incentives for recycled content in construction at present.

Local Government Tax and Permitting Policies and Regulations

- The current local government permitting system with respect to demolition is processed in the same manner as a building permit. There is insufficient provision for deconstruction as the standard process for removal of existing structures and for consideration in the construction of new structures.

- Municipal taxes are commonly required as long as a structure is standing, creating an incentive to demolish structures as quickly as possible rather than taking the time needed for deconstruction.

- Workloads of local government staff may preclude consideration of deconstruction—the permitting process needs to be streamlined and supported by those who are involved by both those who issue, and those who require, permits.

- Issues such as hazardous waste and a deconstruction assessment need to be addressed—there is not a clear inspection process required prior to demolition and it is not clear who would bear the costs of inspection.

Inconsistent Regulatory Regime for Hazardous Materials

- The current regulations and policies governing the assessment and handling of hazardous materials (e.g., the provincial Special Waste Regulation and WCB regulations for asbestos content) are inconsistent in content (if not intent) and inconsistently applied in different areas of the province.

- The local government permitting process needs to dovetail with provincial MELP and WCB regulations governing handling of hazardous materials—procedures for assessment and handling of hazardous materials are not included in most contracts.

Regulatory Disincentives to Appropriate Reuse and Disposal

- The standards and fees for disposal of materials are inconsistent between jurisdictions and may serve as a disincentive for good practice—tipping fees make a huge difference to behaviour!

- Tipping fees need to be consistent within a region, otherwise people will go to the lowest cost provider.

- Regulations for disposal of material do not require a tracking of the material through the deconstruction process (e.g., source and nature of materials, responsible parties for each step of process).

- Disposal regulations need to permit and encourage source sorting, recycling and reuse of materials—diversion credits are needed.

- Disposal fees should also stay in the local community for reinvestment in the deconstruction process, instead of going into general revenue.

Inconsistent Enforcement

- Resources for enforcement of the various regulations governing demolition are lacking and responsibilities are unclear or overlapping in some cases.
- Standards for sorting and types of materials accepted at disposal sites are also inconsistently enforced.
- Reporting of infractions is sporadic and not enabled in present practice.
- Enforcement through industry support and appropriate whistle-blowing needs to be encouraged.
- Increases in tipping fees will result in more attempts to evade the fees through illegal dumping.
- Salvage and disposal situations differ greatly from region to region across the province—universal bans may be neither appropriate nor enforceable. Inter-municipal or regional agreements will be needed before enforcement will be effective.

5.1.3 Lack of Accountability Through the Deconstruction Process

- There is not a clear system for maintaining and tracking accountability through the deconstruction process.
- Individual parties involved in different stages of the construction and deconstruction process often delegate their responsibilities to other parties (implicitly or explicitly).
- For example, land owners prefer not to do a lot of site assessment and hazardous materials investigation, delegating the responsibility instead to the developer. Similarly, responsibility for disposal of demolition materials may be contracted to the transporting company, or consideration of worker safety is left to the WCB to figure out.

5.1.4 Time Required for Deconstruction is Not Given Adequate Consideration

- Deconstruction requires time and planning.
- All involved in the present demolition process need to retool to accommodate and encourage the time needed for the deconstruction process.

- Time is needed for contractors and staff to learn deconstruction practices. There may be ways to decrease the time involved in deconstruction but practices have not yet been sufficiently developed or tested.

- Structures need to be designed for deconstruction.

- The present demolition and development permitting process squeezes the time available for deconstruction from both ends, by encouraging

    - delay of demolition for as long as possible (e.g., to maintain rental stock);
    - development as quickly as possible (e.g., to maximize return on investment), (e.g., the time involved in obtaining a demolition permit and giving tenants appropriate notice to vacate a building may take four to five months out of the six month building permit window available between purchase and development of a property).

- At present, the time input needed for deconstruction may not equal the value output to the owner / developer (would it be possible for a municipality to offer some form of tax relief (e.g., abeyance) during the deconstruction process?).

- The time needed for adequate assessment and testing of a structure, removal of hazardous materials and salvage of materials is often longer than the time available before scheduled demolition. Seasonal considerations may also affect the potential for increasing salvage of materials and the nature of viable deconstruction activities.

5.1.5 Costs and Benefits of Deconstruction Relative to Demolition are Not Well Understood or Accepted

- Everything comes down to money—for materials removal, awareness and education, and market development—deconstruction has to make economic sense.

- In some cases, deconstruction is more costly than demolition (e.g., dependent on size, condition, location, hazardous materials of project). In other cases, deconstruction requires investment in learning new methods or adopting new practices (e.g., new or modified equipment, new materials sorting and / or storage facilities).

- Costs of demolition and disposal are often externalized (i.e., borne by consumers or government in hidden or unknown ways)—the wider social costs of wasting materials and human resource need to be reflected in costs of demolition and disposal.

- The increased labour involved in deconstruction is a significant cost and barrier—contractors can't afford to pay union rates for many deconstruction activities (e.g., preparing salvage materials).

- It may be possible to support job creation or social assistance programs through deconstruction, if appropriate incentives and policies are in place (e.g., hiring of social assistance recipients or "street people").

- There are social benefits to deconstruction (e.g., in increased employment) that need to be considered in any overall assessment of deconstruction versus demolition.

- Taxes (i.e., PST and GST) are still applied to the purchase of reused materials, increasing their cost to consumers although they have already been purchased at an earlier time.

5.1.6 Lack of Cultivated Markets for Deconstruction Materials

- We presently live in a wasteful society that values newness over reused materials.

- Market development is closely linked with public awareness and education.

- People need to be aware of the value and uses of reused material over other alternatives and the lifecycle costs involved with use and disposal of building materials.

- Local markets are growing as people become aware of available materials and their true value.

- International markets for used materials, are inadequately identified and tapped.

- Market opportunities could be identified on the basis of either cost (i.e., the lower cost of some salvaged materials) or quality (e.g., the quality of first growth salvaged timber).

- Markets depend on a steady supply of materials, however, the nature of deconstruction means that the supply is variable (e.g., dependent on number and nature of deconstruction projects planned and underway).

- Markets fluctuate in the prices paid for materials, while other costs involved in deconstruction remain fixed or increase (e.g., tipping fees), leading to difficulties for salvage businesses in maintaining economic viability.

- Applicable local case studies and cost-effectiveness studies are needed to draw more suppliers in to the market.

- Present regulations in many jurisdictions require that material be moved off site before it is sold, thereby increasing the cost of deconstruction.
- Display and demonstration projects showing effective reuse of materials are needed to increase markets.
- Materials storage and display facilities are costly and may require extensive space.
- A central materials exchange mechanism is needed (note that the Recycling Council of BC is presently expanding its "MEX" website to include demolition materials).
- Specific market opportunities need to be identified and developed (e.g., niche marketing of materials with low toxicity or markets for single pane windows and #2 lumber).
- Effective market development is too costly for any one player to undertake—cooperation will be needed—but the deconstruction industry is at a fledgling stage and not well organized, making cooperation difficult.
- Facilities are lacking in some areas of the province for recycling of materials (e.g., aluminum siding, carpeting, underlay) leading to limitations in supply and consequent limits to the market.
- Institutional or regulatory barriers can get in the way of marketing materials from deconstruction (e.g., wood chips available for cogeneration facilities but it may be difficult to interest BC Hydro in providing a market for the power).

5.1.7 Lack of Infrastructure or Appropriate Incentives in Rural Areas

Rural areas face challenges distinct from urban areas of the province, including:

- limited resources to manage a permitting, inspection and enforcement process;
- limited infrastructure (e.g., appropriate disposal sites) or high transportation costs (e.g., ferry fares, highway tolls, trucking costs);
- many opportunities for illegal dumping;
- limited access to information and communication (e.g., no bio-regional databases); and,
- limited markets for salvaged materials (or high costs of transporting materials to markets).

5.2 Toward a Demolition Materials Diversion Strategy

On the second day of the symposium, attention was directed towards solutions to overcome barriers and capitalize on opportunities. Symposium participants formed themselves, into small, informal groups of three ("triads") to develop solutions to share

with other participants. These results were then grouped into the following four areas and discussed in further detail through the afternoon:

- market development;
- education, training and outreach;
- enabling regulations; and,
- coordination.

The results of these discussions during the second day are summarized under the headings below.

5.2.1 Enabling Regulations and Incentives

The initial brainstorm on potential solutions in this topic area generated ideas under a number of separate headings, as described below.

Reduce Time Delays

- Go back to specifications and incorporate deconstruction into overall project plans—for example, for new schools, recognize that the building needs to be taken down over the summer.
- The onus should be on the deconstructors to provide cost / benefit analysis to government and owners and prove that the time required for deconstruction is worth it.
- Incentives should be created in the regulatory system to encourage deconstruction through shortening the approval process.

Tackle Cost Issues

- A law (e.g., bylaw) is needed to prohibit depositing unsorted demolition waste onto the land or a disposal site, and preferential tipping fees could be used to encourage recycling —but otherwise keep the government out of business and let the markets develop.
- Project financiers should be engaged in this process, and encouraged to provide interest breaks to support the deconstruction industry.
- Ensuring that there is a guaranteed market for recycled products will allay the biggest fears of financiers—there are already markets for wood chips in the pulp industry, but we need to guarantee the volume of supply. We also need to be able to provide more information on the business that financiers can use.

Create Regulatory Incentives

- A lot of the value of deconstruction is in residential projects, but these are not well monitored by regulatory agencies. Perhaps send a copy of demolition permits to WCB and do a 6 month blitz of inspections to increase industry compliance in this area.
- Municipalities could create incentives including tax incentives (tax exemptions) on buildings, and could require contractors to submit a reuse and recycling plan to obtain their demolition permit—this could be used as a tracking method if required.
- Change the name from a demolition permit to a deconstruction permit.
- Use higher fees to finance inspections during the demolition / deconstruction process to make sure that, for example, drywall is taken out—then give a rebate of fees for material that does not go to landfill (based on tonnage of materials not landfilled).
- Institute variable / preferential tipping fees for recyclers.
- Amend the building code to allow used materials where it does not jeopardize the safety of workers or integrity of buildings.
- Explore an improved process for re-grading building materials for use in new construction.

Priority Topic: Disposal Costs and Landfill Fees

After reviewing the brainstormed list of ideas and setting initial priorities for action (see Table below), participants discussed tackling disposal costs and landfill fees.

Highest Priority	Medium Priority	Lowest Priority
Change demolition permit fees to create an incentive. Change name from demolition permit to deconstruction permit. Create regulatory incentives by shortening approvals Establish graduated tipping fees. Provide compensation for materials not landfilled. Revise legal statutes to permit the sale of reuseable materials at the job site. Revise rate / volume charges to avoid disincentives for salvage and reuse. Use a bylaw to prohibit dumping of unsorted demolition waste. Require environmental assessments as a pre-condition for obtaining a deconstruction permit	Create deconstruction and reuse application standards for architects. Ensure all demolition & subcontractors are required to meet standards for recycling. Incorporate deconstruction and salvage into operating plans. Require reuse and recycling plans to be submitted with demolition applications.	Building Code changes. Develop generic specifications for all development processes. Establish a process for regrading salvaged lumber.

Participants agreed that financial incentives for bulk disposal of unsorted waste from demolition should be eliminated. Efforts should also be made to standardize tipping fees in different areas. It was also noted that it would be difficult to require standard fees for private landfills. However, other mechanisms were suggested to discourage tipping of unsorted waste, including zero tolerance for hazardous materials, linking disposal permits with demolition / deconstruction permits, and audits at waste facilities to monitor materials disposed of at that location.

Delays were also recognized as a potential barrier to deconstruction. It was agreed that the permitting process should be faster to encourage deconstruction, and that such an approach would require efforts on behalf of the municipalities processing the permit applications, and possible changes to the Tenancy Act to avoid tenant eviction delays.

It was suggested that the key ingredients for preventing the disposal of unsorted wastes and encouraging deconstruction included:

- lobbying government to ensure the needed legislative or regulatory changes;
- securing the support of elected officials at the local and regional level;

- working with landfill operators to ensure that profitability is maintained;
- balancing a partnership approach among stakeholders with a recognition of the need for free, unrestrained enterprise; and
- name changes to differentiate demolition permits from deconstruction permits.

Above all, it was agreed that enabling incentives for deconstruction should be used, rather than mandatory approaches; as one individual put it, "If you make deconstruction more attractive, you won't need a stick!" However, some participants noted that it may be hard to make deconstruction more attractive in the current system, and suggested efforts to make the alternatives to deconstruction *less* attractive at the same time.

5.2.2 Education, Training and Outreach

The initial brainstorming of solutions generated the following ideas:

- develop an education strategy;
- create a website to show examples of products and their eventual application, with pictures; actively advertise the web-site to building and demolition industry, people who do inspection and those who write contracts; create links to nation-wide information;
- identify target groups for education: developers, municipal government, architects, builders; clarify the role of local government—regional districts could act as facilitators and provide information during the permit / inspection process;
- form strategic alliances between groups (e.g. create an organization like RCBC);
- promote deconstruction, salvage and recycling of materials at home shows and workshops to get builders interested in this initiative;
- promote salvaged material content in standards; and,
- prepare and distribute fact sheets for building and demolition industry on what uses are permitted without certification / permits.

It was agreed that targeting of education initiatives was essential for their success. (Some participants also noted that targeting efforts would also indicate marketing opportunities as well as educational needs). Various target groups were identified, including:

- home renovators and builders;
- general public;
- developers;

- retail industry, particularly existing building material suppliers; and,
- design professionals.

Methods suggested for education included:

- the use of broadcast media, such as advertising, internet sites, and materials circulated through educational institutions;
- collaborative initiatives with professional associations, such as planners, engineers, architects and those responsible for the preparation of specifications;
- displays at trade shows and home shows;
- presentations to the Union of B.C. Municipalities (UBCM); and
- linking with environmental green teams.

Messaging was also discussed and it was suggested that deconstruction be linked to sustainability issues, market development and economic opportunities.

Local governments were also encouraged to lead by example and provide role models for deconstruction approaches.

Some participants suggested making use of other opportunities to promote deconstruction, by linking with the capabilities of the Recycling Council of B.C and other organizations, eg., EcoDesign Resource Society, Designers for Social Responsibility, Green Building Council., and using award processes to highlight successes to a broader audience.

Participants agreed that the first logical step would be to form an association of deconstruction contractors to promote the approach. Initial education efforts should then be focused on municipal governments, professional associations (particularly architects and engineers), developers, home builders and renovators.

5.2.3 Market Development

The initial brainstorming of solutions in this topic generated the following ideas:

- reuse salvaged materials on-site in new construction;
- recognize that rates for new materials depend on quantity—this may be a problem for encouraging the use of salvaged materials in construction;
- avoid negative perception of salvaged and recycled product by ensuring quality control (through materials specifications) and strive to ensure a constant supply;

- recognize that salvaged and recycled material cannot cost more than virgin material, or be more difficult material to use;
- develop waste exchange bulletin boards; and,
- consider the development of a marketing strategy, recognizing that the solution might not be to turn us all into marketers, but to use the system that is in place by drawing in the marketing industry and working with retailers (e.g. Revelstoke, Home Depot etc.).

After further discussion, it was agreed that several approaches to marketing would be needed. For example, it was noted that those companies that do not have storage space for salvaged materials would have to rely on job sales at the deconstruction site, whereas larger companies with yards would have yard sales or warehouse sales. In either case, various marketing methods would be needed, including project advertisements, web advertising with a fax-back mechanism built in, automated phone lines, and newspaper advertisements. Consistency in advertising was considered important, so that potential customers know where to look for information. It was also suggested that an industry association (see Section 5.2.4.) could provide a referral service to link customers with potential suppliers.

A number of marketing challenges were identified for companies operating in the interior. For example, transport costs would be prohibitive unless large volumes of salvaged materials could be transported at one time. The lack of infrastructure in some rural areas, such as lack of recycling facilities or value added manufacturers, was also seen as a barrier to the development of deconstruction initiatives.

Some participants suggested that emphasis be given to the development of rural markets in the shorter term—using advertising in local post offices, farmers association newsletters, resort associations, etc., and over the longer term linking with established groups—such as architects, engineers, and/or Canada Mortgage and Housing Corporation. In both cases, the need for liaison and coordination among industry partners was recognized.

5.2.4 Coordination and Accountability

The initial brainstorm on solutions in this topic area generated the following ideas:

- ensure that deconstructors are trained in all aspects of hazardous materials and structural integrity of buildings so that they know what problem areas to look for;
- encourage local governments to lead by example and deconstruct local buildings rather than demolishing them;
- build the credibility of the deconstruction industry through the formation of a deconstruction association;

- develop a code of conduct or a best practices guide like the one developed in the scrap metal industry and then approach government and ask for regulation to give the code it's "teeth";
- develop generic demolition specifications for development projects to be used by architects and developers; and,
- ensure that demolition contractors and all subcontractors reuse and recycle by making it a condition of their contract.

After further discussion, it was suggested that priority attention be given to the formation of an industry association to build alliances, coordinate the preparation of a code of conduct, and provide a credible voice to speak on behalf of its collective members. Others noted that industry needs such a vehicle to communicate together and facilitate the exchange of information. Some participants added that the involvement of major companies would be critical to the success of such an association. In addition to the industry association however, some participants suggested that a forum be provided for on-going dialogue among a wider range of stakeholders, particularly between industry and the various levels of government. This proposal led to discussion of a council made up of all stakeholder groups. Various proposals were offered for moving forward on these proposals, most significantly ensuring that the existing steering committee continue and be expanded to provide leadership, oversee new initiatives and pursue new partners through a series of sectoral or regional follow-up meetings.

For further discussion of coordination, see Section 6.2.

6. NEXT STEPS

6.1 Support and Commitment for Deconstruction

A number of participants commented that while there is strong support for deconstruction among those attending this event, some key sectors are poorly represented and need to be brought into the process. In particular, efforts should be made to broaden the base of support among leading demolition contractors, engage the interest and support of the banking institutions that finance demolition and construction projects, and involve architects, developers, and municipal officials responsible for the permitting process.

Several participants offered their time and energy for specific tasks and actions, including the following:

- working with municipal employees to build support for deconstruction;
- encouraging local newspapers to do an article on deconstruction;
- working with regional districts and municipalities to shift incentives related to tipping fees and permit**s** for deconstruction;
- providing a bridging role to bring potential partners together;
- approaching UBCM to engage their interest in the initiative;
- encouraging discussion of deconstruction among industry leaders, working to overcome scepticism by reassuring contractors that the initiative is genuine, and demonstrating the potential; and,
- working on a web site for deconstruction.

6.2 Coordinating Role of the Steering Committee

Members of the Steering Committee commented that the group is reasonably well rounded and that they would be pleased to continue coordinating this initiative on behalf of all sectors. Other individuals were encouraged to join the Steering Committee, particularly those from industry, and representatives from Kelowna, Williams Lake and Nanaimo Regional District indicated that they would like to join.

6.3 Proposed Future Events and Activities

Through discussion and written comments on the evaluation forms (see Appendix, Section 7.2), the following activities were proposed to advance the DMD initiative.

6.3.1 Networking

Participants strongly supported the preparation and circulation of a summary report from the symposium to a wide range of potential partners. It was also agreed that the Steering Committee had a key role to play in facilitating communication among all those involved, through occasional and informal meetings, and regular e-mail notices to keep everyone up to speed on developments and activities. A first step proposed was the creation of a mailing list or contact list with telephone numbers, fax numbers and e-mail addresses. One participant suggested that this contact information also include a brief profile of the organization or company.

6.3.2 Regional Meetings

Support was expressed for regional events to build on the results of this symposium, broaden support among a wide range of industries and groups, and identify issues of specific relevance to regions other than the lower Mainland and Southern Vancouver Island (e.g., transportation issues, economies of scale, lack of infrastructure). Meetings could also serve to launch specific activities in each region.

6.3.3 Sectoral Meetings

It was suggested that members of the Steering Committee or others could approach sector associations, such as the Architectural Institute of B.C. and the Urban Development Institute, and offer to make presentations and discuss the potential of the deconstruction approach. Less formal contacts with associations were also encouraged.

6.3.4 Formation of an Industry Association

Many participants expressed support for the creation of an industry association to provide credible representation of all industry partners. It was agreed that this process would take time and that efforts should be made by all involved to encourage industry leaders to consider the deconstruction approach, contribute their ideas, and help shape a deconstruction strategy that meets their needs as well as those of others.

6.3.5 Development of Information Materials, a Discussion Paper, and a Strategy Document

It was acknowledged that more work was needed to take some of the initial ideas shared at the symposium and develop other products and tools, including:

- a basic education kit, as a first information tool for broad distribution;
- a more detailed discussion paper for distribution among interested groups and individuals; and,
- a draft deconstruction strategy outlining the role to be played by each sector—in consultation with those involved—and clear implementation steps with timeline and tracking / accountability mechanisms to ensure that tasks are completed.

The Steering Committee could serve as the focal point for this activity, although it was noted that the work should not be done in isolation from the broader group of supporters of the deconstruction approach.

7. APPENDICES

7.1 Symposium Agenda

Symposium Objectives

The objectives of the Demolition Materials Diversion Symposium are to:

- explore "de-construction" as a possible strategy for achieving both the proper management of hazardous materials and the maximum diversion of building materials from disposal;
- build understanding of how the hazardous components of buildings must be managed in order to minimize impacts on the environment and on worker and public health;
- build awareness of the actual and potential economic value of many building components, and identify the barriers and opportunities for greatly increasing the diversion rate through reuse and recycling; and,
- develop a provincial demolition material diversion strategy that depends on the cooperation of all relevant sectors and describes the involvement of each sector in the demolition process.

Tuesday, May 12

7.30	Registration opens (refreshments available)
8.30	Welcome and introductions (Brian Grant, MELP, Workshop Chair)
	Facilitators' introductions (Julian Griggs, Dovetail Consulting Inc., & Colin Rankin, SALASAN Associates Inc.)
8.50	Keynote Address: Ron Driedger, Director, Pollution Prevention and Remediation, MELP
9.00	Panel Presentations: *Proper Management of Hazardous Materials* • Special Waste Regulation (Kul Bindra, MELP) • Worker Health and Safety Concerns (Mike Quigley, WCB) • Environmental Assessment (Peter Hansen, PECOHS) • Abatement of Hazardous Materials (Jeff Westeinde, Quantum)
10.30	Refreshment Break
10.45	Panel Presentations: *Increasing the Salvage and Recycling of Demolition Materials* • Illegal Dumping (Mike Stringer, GVRD) • The Deconstruction Process (Corinne Fulton, Litchfield) • Waste Reduction Implications (Thomas Mueller, GVRD) • Building Codes / Demolition Permits (Peter Sweeney, City of Vancouver)
12.30	Lunch
1.30	Working Groups: *Barriers and Opportunities for Increasing Salvage & Recycling*
3.00	Refreshment Break
3.15	Plenary Discussion of Working Group Results
4.30-6.00	Trade Show and No-Host Bar

Wednesday, May 13

7.30	Registration opens (refreshments available) Results displayed from Day 1
8.30	Introduction and summary of Day 1 (Symposium Facilitators)
9.00	Panel Presentations: *The Deconstruction Process—Case Studies* • Environmental Assessment / HazMat Abatement (Jeff Westeinde, Quantum) • Deconstruction: Economic Benefits (Bevin Hodgins, Dale's Salvage) • Deconstruction: Competitive Tendering Process (Ron deVries, DCC) • Markets and End Uses for Salvaged Materials (Corinne Fulton / Thomas Mueller)
10.30	Refreshment Break
10.45-11.15	Small group discussions: *Potential Solutions for British Columbia*
11.15	Plenary Discussion: *Identifying Potential Solutions*
12.00	Lunch
1.00	Working Groups: *Solutions and Action Steps*
3.00	Working Refreshment Break Sector Caucuses
3.45	Plenary Discussion: *Identifying Action Steps and Commitments*
4.20	Wrap up (Workshop Chair)
4.30	Symposium Close

7.2 Summary of Evaluation Forms

28 evaluation forms were completed by symposium participants. The following material summarizes the results of these forms. Scores are shown *in italics* with averages (in brackets). Comments are attributed by sector where relevant.

Overall, how would you rate this workshop?

circle one:	(poor) 1	2	3	4	5 (excellent)
			1	*17*	*10 (4.3)*

Comments:

- Need more support from the demolition industry.
- Hopefully the momentum will keep up.
- Excellent facilitation—a bit more time for presentations.
- Very good but needs more concentration of primary issues in the minds of those attending.
- Good non-threatening atmosphere—everyone willing to be constructive.
- Very knowledgeable.
- Facilitators engendered good tone.
- Very focused—results oriented.
- Very well run—schedule was maintained and facilitators were excellent.
- Considering this was the first effort of the initiative, lots of good ground was covered. Well balanced process.

What words best describe your feelings about this meeting? (Select as many as you like)

24	Interesting	*24*	Organized	*9*	Enjoyable
0	Disorganized	*2*	Too long	*9*	Provocative
5	Exciting	*23*	Informative	*0*	Boring
2	Repetitious	*1*	Overly complex	*11*	Challenging
15	Stimulating	*6*	Inspiring	*0*	Overly simplistic
10	Well balanced	*0*	Unsatisfactory	*1*	Too short

The standard of the facilitation at this workshop was:

J. Griggs:	(poor) 1	2	3	4	5 (excellent)
				15	*11 (4.4)*
C. Rankin:	(poor) 1	2	3	4	5 (excellent)
				16	*9 (4.36)*

Comments:

- Kept things running smoothly.
- Very well led—kept the flow. Both handled issues with discretion where necessary.
- A bit too aggressive at the wrap-up.
- Good leadership.

- Time keeping poor on Day 2.
- Very professional.

Were you clear on the objectives of the meeting? *25* Yes *1* No
Comments:

- Not initially.
- The main objective was clear and discussion was kept on topic.

Did you feel that we achieved the objectives of the meeting? *23* Yes *1* No
Comments:

- Will take time for demo contractors to allow new people to teach them how to do their business.
- Yes to objectives—but the meeting needs to have momentum for the next stage—this may not have been achieved.
- It will take a lot more work to educate people.
- Good strategies evolved within the discussion groups. Needs a well thought-out implementation strategy.

What kinds of follow-up activities or information would you like to see as a result of this symposium?
Comments:

- A deconstruction association formed. Need to get Association of BC Deconstructors (ABCD!) going. (2)
- Mailing list—on-going Steering Committee—contacts and resources. Report on all discussions. Steering Committee to coordinate implementation. (2)
- Transcript. Mail-out summary of symposium results and actions. Summary Report. A summary of issues and solutions sent to participants. Copy of how we provide solutions. (7)
- Topics to move forward. Follow-ups to topics covered with recommendations. But keep it simple. (2)
- A strategy that contains informative and clear procedures and is disseminated to all the stakeholders. Strategy broken down by sector (who should do what)—with how the province intends to facilitate the strategy's implementation. (2)
- Regional meeting to follow this one. Regional groups would meet again to develop strategies for their area, using this symposium as a launch pad. (2)
- Sector meetings—information provision.
- More education to the general public.
- Action—information flow.
- I would like to see fundamental changes in the attitude of people towards deconstruction and the three Rs.
- Organize industry; improve information; education.

- Follow-up on actions / initiatives undertaken as a result of this seminar.
- Possibly another symposium next year to determine success of proposed roles and approaches.

What are the most important next steps for developing a strategy for the deconstruction process in British Columbia?

Comments:

- Make everyone address hazmats—equal costs for dumping.
- Builder / contractor feedback; public education.
- Education and regulation change. Education. (2)
- Changing perception. When people realize it is "worth it" to deconstruct rather than demolish, they'll deconstruct.
- Political policy.
- Develop plan and set objectives.
- Develop a further clearer plan and keeping in mind not to prolong the process and look for implementing recommendations.
- Develop a public education kit to send to all local governments, non-profit groups—facilitate market development.
- Get industry to improve communication with each other and with consumers.
- Forming an association to continue the momentum identified at this seminar. Have association meet / contact other groups (e.g., Building Inspectors groups) form regulations to encourage deconstruction. (4)
- Higher profile.
- Establish credibility.
- Wood waste recycling options for BC—markets!
- Policy.
- Amend the BC Building Code; establish a look at feasibility of setting up a deconstruction permit at local levels; preferential disposal rates at landfill to those abiding by the deconstruction process.
- Regional input. (2)
- Distill ideas—engage a more cross-sectional representation on the Steering Committee.

If a similar meeting was to be planned for the future, what would you do differently to improve the event?

Comments:

- Just learn a lot as this time.
- I agree another meeting would be useful. Make sure we build on work to date—not repeat, but refine implementation strategy—engage those not responsive to date.
- Send out more invitations—need more representatives from the targeted industry (2000 invitations may yield 100-150 delegates).

- Regional constraints and opportunities; more contractor/builder feedback.
- Lobby the stakeholders with more information.
- None. N/A (2)
- Let outside regional Districts speak on how they have attacked the plan.
- Have more discussion time.
- Reduce time spent for general organizational issues.
- Keep focusing on achieving the desired outcome—this meeting evolved well.
- Narrower focus—sectoral/regional.
- Attendees seem to know the issues and are here to get into solutions—need to get into this a.s.a.p. Attendees are bought in.
- Have decision-makers attend if government.
- In addition to providing an overview of existing applicable regulations, include/provide information on selected policies and alternative mechanisms, where available, which address the regulatory conflicts.
- Shorter format.
- If in Kelowna or outside the Lower Mainland, should focus more on construction waste, as well as demolition waste (less demo in newer, urban areas and products/processes are intricately linked.)

10. Any other comments?

Comments:

- Excellent effort! Out of tiny acorns mighty oaks will grow!
- Excellent step in the right direction.
- Great learning experience.
- Excellent seminar—facilitators worked very well together to draw groups together and create dialogue.
- The issue of the stakeholders that needs this information not attending is significant. There's a need to address this sector—need to figure out how to get their ear. (Go to them?).
- Group sessions were productive. Recapping was drawn out.
- Loved the natural light! Food awesome. Larger print should be used on presentors' overheads. Less or shorter recapping—1/2 hour was way too long—rather hear from speakers. Liked reception format for casual networking.

7.3 Participant List

7.4 Proposal Preparation and Submision Instructions - Defense Construction Canada

This appendix contains the documents handed out by Ron DeVries after his presentation during the second morning of the symposium.

7.5 Shared Expertise, Positions or Recommendations

In the original invitation to attend the DMDS, invitees were encouraged to share relevant experience / expertise, positions or recommendations that would be of interest to readers of the final report. The following persons or firms responded to this offer and their submissions are included in this Appendix:

- Budget Steel Ltd
- M.J. Recycling
- John MacRae and Associates
- DEMXX Deconstruction Inc.

budget steel ltd.

Recycling Metals and Wood

2770 Pleasant Street, Victoria, BC., V8T 4V3
e-mail; wmburrows@ibm.net
Tel: (250) 381 5865 **Fax:** (250) 381 3866

Company Profile

Budget Steel Limited was incorporated in 1981 and is the major recycler of metal and wood products on Vancouver Island. We employ over 40 staff to drive, process, operate and manage a business that has annual sales of over $11 million. Located on Selkirk Water in the City of Victoria, British Columbia, our 7 acre lot houses state-of-the-art reduction, separation and processing systems. Materials are transported from all regions of the Island and processed through our automobile shredder, one of only two located in BC, at a rate of 65 tonnes per hour. This machine reduces whole "scrap" automobile hulks, white goods and other metals, down to "fist sized" pieces. It then separates the ferrous metals (iron, steel) from the non-ferrous (copper, aluminum, etc.) and the "fluff" (rubber, plastics, glass, etc.). The ferrous metals are stockpiled before being shipped out, by barge, to markets in Washington and Oregon. The non-ferrous and fluff material is further processed to separate other metallic components before going to market. Fluff is used by local landfills as a daily covering material for vermin control and to stabilize the waste. The non ferrous metals are sold in bulk to markets in North America.

Our commitment to environmental concerns is reflected by a rigorous inspection of all incoming materials. We do not accept contaminated or hazardous material for processing. All vehicle hulks must be prepared for recycling by draining the fluids and removing the battery. Tanks and other vessels must be drained and have a hole cut in them for inspection. Staff are HRAI certified to ensure the correct handling, recovery and storage of CFC containing equipment bought in for recycling.

Budget Steel is constantly looking at new recycling applications to further reduce the volume ending up in landfills, saving both space and cost. As part of our on going development we were able to modify our shredder to accept waste wood from construction and demolition sites, stumps, storm debris and other wood products. This material is shredded to reduce the size and enable the metals to be removed. Once in this form it is suitable for cover, temporary road construction or as hog fuel. We have worked with and advised Municipalities, Regional Districts and companies throughout Vancouver Island helping them solve their scrap problems. Budget Steel Ltd. is responsible, bondable and financially secure as well as Vancouver Island's largest recycler of metal and wood. We are members of the Canadian Association of Recycling Industries and the international body, the Institute of Scrap Recycling Industries. General Manager Irene Gowler is Treasurer for the Pacific Northwest Chapter of the Institute of Scrap Recycling Industries and Mr. Berman a former President.

President: Fred Berman
General Manager: Irene Gowler

References:
Hong Kong Bank of Canada. Victoria BC. (250) 388 6465 Mr. Bob Ramshaw

SIMS LMC Recycling, Seattle, WA. (206) 935 5555 Mr. Lance Green

WMB / May 1998

M.J. Recycling *

1998-05-04

Hello

Here are some of the problems that M.J. Recycling has with the current demolition situation:

- lack of information on demolition permits - we go to city hall but demolition permits do not contain names, so we cannot contact the owner regarding salvage rights;
- lack of time - buildings are demolished the day after the demolition permit is issued;
- illegally blocked access to permits - some people go to City hall and steal demolition permits so other people or companies cannot bid for salvage rights;

Here are some ideas to solve problems

- make sure every building is salvaged before being demolished;
- local governements allow only businesses or registered people to look at demolition permits;
- stop people from having on-site demolition sales - this is unfair competition for legitimate salvage and recycling firms because the on-site sales pay cash and carry no insurance. If someone were hurt at such a sale, the homeowner would be liable for the injured person.

Jerome Klett

* M.J Recycling is no longer in business as a wood recycler

John MacCrae & Associates Inc.
Environmental Health Services

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1998-03-02

Mr. Brian Grant
BC Environment, Lands and Parks

RE: Disposal of Building Related Hazardous Materials Symposium

Dear Mr. Grant:

With reference to our telephone discussion of 98-02-27, I have the following comments and concerns regarding the issue of disposal of building related hazardous materials.

John MacCrae and Associates Inc. was establihsed in 1984 and has been involved with the identification, management and disposal of hazardous materials since that time. We are also involved with other health related issues such as indoor air quality, causes of allergies, multiple chemical sensitivites, use and management of pesticides, and so on.

With respect to the disposal of building related hazardous materials, I see the problem as involving two basic and interrelated components:

1. Existing buildings, and
2. New construction

Both components involve public and private buildings.

EXISTING BUILDINGS

The generation of hazardous materials in existing buildings can arise though the demolition of a building or though renovations to a building. Both of these activites will likely involve one of more of the following:

- Building Owner
- Tenant / Occupant
- Architect
- Structural Engineer
- Mechanical Engineer
- Cost Consultant
- Construction Contractor
- Mechanical Contractor
- Electrical Contractor
- Hazardous Materials Consultant
- Hazardous Materials Abatement Contractor

The Hazardous Materials Abatement Contractor and the Hazardous Materials Consultant are the people least likely to be involved, and their involvement is least likely to occur with privately owned buildings.

NEW CONSTRUCTION

New construction will involve similar people or groups, with the exception of the Hazardous Materials Abatement Contractor and the Hazardous Materials Consultant.

The exclusion of the Hazardous Materials Abatement Contractor is logical and understandable. The exclusion of the Hazardous Materials Consultant is not, due to the fact that hazardous materials (those known and those that will become known) continue to be introduced to newly constructed buildings. The inevitable renovation activities that will arise subsequent to new contruction will also exlcude the Hazardous Materials Consultant primarily because it is erroneously considered that the newly or recently constructed building does not contain hazardous materials.

IDENTIFYING THE PROBLEM

It is well known that the existence of hazardous materials is being ignored by the majority of the people and groups listed, beginning with the building owners and including the architects, consultants and contractors. Even where the building owner, or his or her representative, tries to openly address the issue, the resistance encountered from the architects, the various engineers and the contractors can be insurmountable and can result in defeat.

Even though there are existing regulations governing the handling of most hazardous materials, and the issue has been highly publicized for some twenty years, the architects and consulting engineers (and some others) continue to ignore the problem. Their apparent arrogance in making what would appear to to be a willful decision to ignore an issue that may have substantial health implications for others is astounding.

There are also other new and emerging health issues (such as fungi contamination, which should be considered a hazardous material) that are being ignored. Fungi contamination resulting from water leakage into building may be a result of poor or inadequate architectural design and construction practices. The result is that building material contaminated with and damaged by fungi is not being dealt with as a health issue but simply as a construction problem.

SUMMARY

It is curious, frustrating and of great concern that an important segment of our society, who are otherwise upstanding, responsible and caring citizens, are exactly the opposite with respect to the issue of the handling and disposal of hazardous materials.

This problem is very complex and will not easily be resolved. If I may suggest, I believe that the policy makers and shapers need to be heavily involved in a programme of education to instill a measure of understanding and awareness of the issues. The implementation of regulations withour the educational component does not work.

Yours truly,

JOHN MACRAE & ASSOCIATES INC.

Original signed by

John MacCrae

DEMXX DECONSTRUCTION INC.

3156 Grafton Avenue, Qualicum Beach BC V9K 1W7
Phone / Fax: 250-954-0296

Demxx Deconstruction Inc. was incorporated in British Columbia to engage in the demolition and recycling business. The firm is now in its third year. The firm is owned by two active principals, Alan Parkin and Brian Lea, who collectively have over 45 years involved in material salvage.

Demxx, while focusing on cost-effective demolition, has opted for a materials handling route not taken by most demolition operators: the salvage of a wide variety of building materials from the demolition sites for functional recycling. Routinely recycled building materials include:

- Siding
- concrete block
- structural steel
- dimension lumber
- stairs
- carpet
- pumps
- furnaces
- mechanical omponents
- piping
- electrical panels
- brick
- custom roofing
- safes
- plumbing fixtures
- vents
- plants and trees
- beams
- trusses
- wiring
- flooring
- pavers
- windows
- exterior doors
- alarms
- gutters
- interior doors
- safety lights
- electrical fixtures
- water heaters

Demxx resells its salvaged building material to agricultural, commercial, residential and industrial users and recyclers. The deconstruction process necessitates extreme care in material removal to guarantee reusability, a higher labour component than mechanical demolition, and an understanding of past construction methods and materials. It also requires consideration of health and safety practices and current building codes in order that the salvaged components are always suitable for reinstallation in a new building application.

As any builder cannot always use 100% salvaged material, both new and used building materials are available on our site. The mixture of materials appeals to a clientele which requires cost-effective building solutions. If a consumer wishes, Demxx can also arrange for custom manufacturing or remanufacturing of materials to complement a particular architectural style or design, or facilitate installation of feature materials such as antique beams or doors.

In mid-1988 Demxx will be moving from the present three acre facility to a dedicated 20 acre parcel of clear, flat land, appropriately zoned for its business activities, near Parksville, British Columbia. The new site has a large enclosed warehouse accessible by highway trucks and of suitable height for forklift material handling. It also has approximately 7000 square feet of retail space and extensive fenced and unfenced yard space. At this site the salvaged materials receive any final sorting and are prepared for sale.

Demxx is proud to be an established leader in building deconstruction and recycling in British Columbia.