This is a guidance document with sample specification language intended to be inserted into project specifications on this subject as appropriate to the agency's environmental goals. Certain provisions, where indicated, are required for U.S. federal agency projects. Sample specification language is numbered to clearly distinguish it from advisory or discussion material. Each sample is preceded by identification of the typical location in a specification section where it would appear using the SectionFormat™ of the Construction Specifications Institute; the six digit section number cited is per CSI Masterformat™ 2004 and the five digit section number cited parenthetically is per CSI Masterformat™ 1995.

SECTION 06 10 00 (SECTION 06100) – ROUGH CARPENTRY

SPECIFIER NOTE:

resource management Wood is a renewable resource. Forests provide many environmental benefits, including: habitats, potential sources for medicines, and climatic control. Many certified sources of sustainably harvested wood are available. Non-sustainable harvesting of wood can produce soil erosion, pollutant runoff, increased levels of atmospheric carbon dioxide, global warming, and habitat loss.
Forest Certification Standards in North America include:

- The American Tree Farm System developed by the American Forest Foundation; refer to www.treefarmsystem.org/aboutfarming/whatis.cfm
- Canada's National Sustainable Forest Management Standard; refer to http://certifiedwood.csa.ca
    - ISO 14001 developed by the International Organization for Standardization. Although not a forest-specific standard, ISO offers a special technical report ISO 14061 that is specific to forestry and assists with implementation of ISO 14001 in forestry; refer to www.iso.ch
- The Principles for Natural Forest Management developed by The Forest Stewardship Council; for Canada visit www.fsccanada.org, for the USA visit http://fscus.org/certification/index.html
- The Sustainable Forestry Initiative® created through the American Forest & Paper Association and currently managed by the Sustainable Forestry Board (an independent entity established to manage SFI); refer to www.afandpa.org/Content/NavigationMenu/Environment_and_Recycling/SFI/SFI.htm

Most trees in the United States are referred to as either "hardwoods" or "softwoods." Hardwood trees are deciduous trees that, with a few exceptions, lose their leaves in the fall or winter. Softwood forest types are conifers and evergreens such as pines, spruces, firs, and junipers. Wood that is used in construction of buildings is primarily softwood.

Much of America's hardwoods, such as oaks, are found along the East Coast. Softwood trees are concentrated in the West and South. Douglas-fir is the dominant softwood in the West, while Southern pines, such as loblolly and shortleaf, are the most abundant softwoods in the South. Quaking aspen, a hardwood, is the most widely distributed tree species in North America.

The term "Engineered Wood Product" (EWP) refers to a wood-based product that has a set of design properties assigned to it. EWPs are often manufactured as a combination of smaller pieces of wood that together create larger high strength structural elements or components. Engineered wood components include: plywood, oriented strand board (OSB), composite wood panels, glue laminated beams, structural composite lumber, including laminated veneer lumber and parallel strand lumber, as well as I-joists and metal plate connected wood trusses. An additional sub-component of structural composite lumber would include laminated strand lumber. Finger-jointed lumber, which is interchangeable with solid sawn lumber, is also considered an EWP. Finger-jointed lumber or end-jointed lumber is permitted to be used interchangeably with solid-sawn members of the same species and grade. However, when finger jointed lumber is marked "STUD USE ONLY" or "VERT USE ONLY" such lumber shall be limited to use where any bending or tension stresses are of short duration.
Engineered wood products are typically prefabricated, not site fabricated.
Engineered wood products are frequently more efficient in construction of assemblies than solid sawn lumber due to the lower coefficient of variance of EWPs. EWP assemblies tend to be more resource efficient than assemblies constructed of solid sawn members.

toxicity/IEQ: Adhesive binders used in engineered wood products are any of several synthetic resins that pose varying degrees of human health risks. Refer to Section 06 05 73 (06070) – Wood Treatment for information regarding treated wood.

performance: Wood is a natural and efficient building material. The structural design characteristics of wood change over time as a result of changes in weather and other growing factors. These changes in structural design values of various wood species are recorded through a in-grade testing program of lumber and published periodically in ANSI/AF&PA's National Design Specification© (NDS©) for Wood Construction. For efficient resource use of solid sawn lumber, it is recommended that the least acceptable grade of lumber be specified to suit the purpose. As an alternate to new solid sawn lumber, reclaimed lumber can be used since it performs comparably to new lumber if properly graded by a grading agency in accordance with American Lumber Standards Committee grading rules. Further, the use of engineered wood products can result in resource efficiencies than might be expected of conventional lumber/timber construction. However, engineered wood products might be more difficult to recycle than standard, solid sawn lumber due to the binders used in the manufacture of the engineered wood product

PART 1 - GENERAL

1.1 SUMMARY

A. This Section includes:
   1. Framing with dimension lumber.
   2. Engineered wood products.
   3. Wood furring, grounds, nailers, and blocking.

B. Related Sections:
   1. 06 05 73 (06070) - Wood Treatment.
   2. 06 16 00 (06160) – Sheathing.

1.2 SUBMITTALS

A. Product data. Unless otherwise indicated, submit the following for each type of product provided under work of this Section:

SPECIFIER NOTE:
Green building rating systems often include credit for materials of recycled content. USGBC-LEED™ v3, for example, includes credit for materials with recycled content, calculated on the basis of pre-consumer and post-consumer percentage content, and it includes credit for use of salvaged/recovered materials.
Green Globes US also provides points for reused building materials and components and for building materials with recycled content.

1. Recycled Content:
   a. Engineered Wood Products:
      1) Indicate recycled content; indicate percentage of pre-consumer and post-consumer recycled content per unit of product.
      2) Indicate relative dollar value of recycled content product to total dollar value of product included in project.
      3) If recycled content product is part of an assembly, indicate the percentage of recycled content product in the assembly by weight.
      4) If recycled content product is part of an assembly, indicate relative dollar value of recycled content product to total dollar value of assembly.

SPECIFIER NOTE:
Salvaged lumber is lumber that had been previously utilized and has been salvaged for reuse. Salvaged lumber may also be referred to as 'reclaimed lumber.'

b. Salvaged Lumber: Provide documentation certifying products are from salvaged lumber sources.

SPECIFIER NOTE:
Recovered lumber is lumber that had been previously harvested but which had been abandoned in transit to riverbeds or lakes.

c. Recovered Lumber: Provide documentation certifying products are from recovered lumber sources.

SPECIFIER NOTE:
Specifying local materials may help minimize transportation impacts; however it may not have a significant impact on reducing the overall embodied energy of a building material because of efficiencies of scale in some modes of transportation.
Green building rating systems frequently include credit for local materials. Transportation impacts include: fossil fuel consumption, air pollution, and labor. USGBC-LEED™ v3 includes credits for materials extracted/harvested and manufactured within a 500 mile radius from the project site.
Green Globes US also provides points for materials that are locally manufactured.

2. Local/Regional Materials:
   a. Sourcing location(s): Indicate location of extraction, harvesting, and recovery; indicate distance between extraction, harvesting, and recovery and the project site.
   b. Manufacturing location(s): Indicate location of manufacturing facility; indicate distance between manufacturing facility and the project site.
   c. Product Value: Indicate dollar value of product containing local/regional materials; include materials cost only.
   d. Product Component(s) Value: Where product components are sourced or manufactured in separate locations, provide location information for each component. Indicate the percentage by weight of each component per unit of product.

SPECIFIER NOTE:
Green building rating systems may include credit for low emitting materials. USGBC-LEED™ v3, for example, includes credits for low-emitting materials, including: adhesives and sealants, paints and coatings, carpets, and composite wood and agrifiber products. Under LEED™ v3, adhesives and sealants are to comply with California's South Coast Air Quality Management District (SCAQMD) #1168; aerosol adhesives are to comply with Green Seal GS-36; interior architectural paints are to comply with Green Seal GS-11; anti-corrosive paints are to comply with Green Seal GS-03 (note – Green Seal has withdrawn GS-03; as of November 2008, anti-corrosive paints are included in a revised GS-11); clear wood finishes are to comply with SCAQMD #1113; carpet with the Carpet and Rug Institute (CRI) Green Label Plus; carpet cushion with CRI Green Label program; hard surface flooring with FloorScore; tile setting adhesives and grout with SCAQMD #1168; and, composite wood and agrifiber products are to contain no added urea-formaldehyde.
As per USGBC published Credit Interpretations, the credits for low-emitting materials are directed towards interior, site-installed (i.e. not prefabricated) products. Verify project requirements for low VOC roofing products.
Both the Adhesive and Sealant Council (ASC) and the SCAQMD have indicated that low VOC adhesives may have performance difficulties in extreme temperature and humidity conditions.
Green Seal, an independent, non-profit organization, certifies low-emitting products using internationally recognized methods and procedures. Green Seal certification meets the criteria of ISO 14020 and 14024, the environmental standards for ecolabeling set by the International Organization for Standardization (ISO); the U.S. Environmental Protection Agency's criteria for third-party certifiers of environmentally preferable products; and the criteria for bona fide ecolabeling bodies of the Global Ecolabeling Network.

Engineered wood products manufactured in accordance with ANSI standards are also available. For example, the Composite Panel Association's (CPA's) Standard for Particleboard, ANSI A208.1, includes maximum formaldehyde emissions for different grades of particleboard; ANSI A208.2, the Composite Panel Association's Standard for MDF, covers MDF for interior applications and includes maximum formaldehyde emission level for different grades of MDF.

3. VOC data:
   a. Adhesives:
      1) Submit manufacturer's product data for adhesives. Indicate VOC limits of the product. Submit MSDS highlighting VOC limits.
      2) Submit Green Seal Certification to GS-36 and description of the basis for certification.
      3) **[Submit manufacturer's certification that products comply with SCAQMD #1168.] [Submit manufacturer's certification that products comply with SCAQMD Rule 1168 in areas where exposure to freeze/thaw conditions and direct exposure to moisture will not occur. In areas where freeze/thaw conditions do exist or direct exposure to moisture can occur, submit manufacturer's certification that products comply with Bay Area AQMD Reg. 8, Rule 51 for containers larger than 16 oz and with California Air Resources Board (CARB) for containers 16 oz or less.]**
   b. Engineered Wood Products: Provide documentation that composite wood and agrifiber products **[are third-party certified as meeting ANSI standard requirements for formaldehyde emissions] [contain no added urea-formaldehyde resins.]**
      1) ANSI A208.1 – 1999, Particleboard
      2) ANSI A208.2 – 2002, Medium Density Fiberboard (MDF) for Interior Applications

SPECIFIER NOTE:
Green building rating systems typically include credit for sustainably harvested wood. USGBC-LEED™ v3, for example, includes credit for use of sustainably harvested wood certified under Forest Stewardship Council Guidelines. Under LEED™ v3, a minimum of 50 percent of wood-based materials and products incorporated into the Project must be certified in accordance with the Forest Stewardship Council Guidelines.
Green Globes US also provides points for wood products that originate from certified sources, such as, Forest Stewardship Council, Sustainable Forestry Initiative, and the CSA Sustainable Forest Management Program.

B. Letter of Certification(s) for Sustainable Forestry:
   1. Forest Stewardship Council (FSC): Provide letter of certification signed by lumber supplier. Indicate compliance with FSC "Principles for Natural Forest Management" and identify certifying organization.
      a. Submit FSC certification numbers; identify each certified product on a line-item basis.
      b. Submit copies of invoices bearing the FSC certification numbers.
   2. Sustainable Forestry Board: Provide letter of certification signed by lumber supplier. Indicate compliance with the Sustainable Forestry Board's "Sustainable Forestry Initiative" (SFI) and identify certifying organization.
      a. Submit SFI certification numbers; identify each certified product on a line-item basis.
      b. Submit copies of invoices bearing the SFI certification numbers.
   3. Canadian Standards Association (CSA): Provide letter of certification signed by lumber supplier. Indicate compliance with the CSA and identify certifying organization.

a. Submit CSA certification numbers; identify each certified product on a line-item basis.
b. Submit copies of invoices bearing the CSA certification numbers.

1.3 QUALITY ASSURANCE

A. Sustainably Harvested Wood: Certification Organizations shall be accredited by the **[Forest Stewardship Council] [Sustainable Forestry Board] [Canadian Standards Association]] [xxxxxxxx]**.

B. Recycled Content Materials: Where recycled lumber materials are used for structural applications, include lumber certification and quality grading.

C. VOC emissions: Provide low VOC products.
1. Engineered Wood Products: Provide products with no added urea formaldehyde.
a. Determine formaldehyde concentrations in air from wood products under test conditions of temperature and relative humidity in accordance with ASTM D6007 or E1333.
b. Determine Volatile Organic Compounds VOC), excluding formaldehyde, emitted from manufactured wood-based panels in accordance with ASTM D6330.

PART 2 - PRODUCTS

SPECIFIER NOTE:
EO 13423 includes requirements for Federal Agencies to use “sustainable environmental practices, including acquisition of biobased, environmentally preferable, energy-efficient, water-efficient, and recycled-content products”

Specifically, under the Sustainable Building requirements per Guiding Principle #5 Reduce Environmental Impact of Materials, EO13423 directs Federal agencies to “use products meeting or exceeding EPA's recycled content recommendations” for EPA-designated products and for other products to “use materials with recycled content such that the sum of post-consumer recycled content plus one-half of the pre-consumer content constitutes at least 10% (based on cost) of the total value of the materials in the project.”

Additionally, for USDA-designated biobased products, Federal agencies must use products meeting or exceeding USDA's biobased content recommendations; and for other products, biobased products made from rapidly renewable resources and certified sustainable wood products.

And, under the Sustainable Building requirements per Guiding Principle #4 Enhance Indoor Environmental Quality, EO13423 directs Federal agencies to use “materials and products with low pollutant emissions, including adhesives, sealants, paints, carpet systems, and furnishings.”

Executive Order 13514; *Federal Leadership in Environmental, Energy, and Economic Performance*; was signed on October 5, 2009. http://www.ofee.gov/execorders.asp It expands upon the environmental performance requirements of EO 13423.
http://www1.eere.energy.gov/femp/regulations/printable_versions/eo13423.html

EO 13514 sets numerous federal requirements in several areas, including sustainable buildings and communities. Federal agencies must implement high performance sustainable federal building design, construction, operation and management, maintenance, and deconstruction, including:
- Ensuring all new Federal buildings, entering the design phase in 2020 or later, are designed to achieve zero net energy by 2030.
- Ensuring all new construction, major renovations, or repair or alteration of Federal buildings comply with the Guiding Principles of Federal Leadership in High Performance and Sustainable Buildings http://www1.eere.energy.gov/femp/pdfs/mouhighperfsustainfedfacs.pdf

- Ensuring at least 15% of existing agency buildings and leases (above 5,000 gross square feet) meet the Guiding Principles by fiscal year 2015 and that the agency makes annual progress towards 100% compliance across its building inventory.

2.1 MATERIALS

A. Lumber:
1. Resource Management:

SPECIFIER NOTE:
Disallowing the use of old growth timber may conflict with use of timber recovered and cut from public lands than have been burned in a wildland fire. As of this draft, two examples of viable and on-going timber salvage from past wildland fires on public land are the 500,000 acre (60 mile x 60 Mile) Biscuit Fire in SW Oregon and the 150,000 acre (10 mile x 5 mile) McNally Fire in the South Central Sierra Nevada.

a. Virgin Lumber: **[Lumber fabricated from old growth timber is not permitted.]** Provide sustainably harvested; certified or labeled in accordance with **[FSC] [SFI] [CSA] [xxxxx]** guidelines.

b. Salvaged Lumber: Lumber from deconstruction or demolition of existing buildings or structures. Unless otherwise noted, salvaged lumber shall be delivered clean, denailed, and free of paint and finish materials, and other contamination.

c. Recovered Lumber: Previously harvested lumber pulled from riverbeds or otherwise abandoned. Unless otherwise noted, recovered lumber shall be delivered clean and free of contamination.

B. Engineered Wood Products: As specified in Section 06 16 00 (06160), Sheathing, and as follows:
1. Toxicity/IEQ:
a. Products shall contain no added urea-formaldehyde.

2.2 ACCESSORIES

A. Adhesive:
1. Toxicity/IEQ: Comply with applicable regulations regarding toxic and hazardous materials, GS-36 for Commercial Adhesive, **[South Coast Air Quality Management District Rule 1168] [Bay Area AQMD Reg. 8, Rule 51 for containers larger than 16 oz and with California Air Resources Board (CARB) for containers 16 oz or less],** and as specified.

B. Fasteners:
1. Recycled Content: Fabricated from 100 percent re-melted steel.

PART 3 - EXECUTION

3.1 INSTALLATION

A. Install as indicated and in accordance with the National Association of Home Builders (NAHB) Advanced Framing Techniques: Optimum Value Engineering.

3.X SITE ENVIRONMENTAL PROCEDURES

A. Indoor Air Quality:
1. Temporary ventilation: Provide temporary ventilation during work of this Section.

a. During and immediately after installation of treated wood, engineered wood products, and laminated wood products at interior spaces, provide temporary ventilation.

B. Waste Management: As specified in Section 01 74 19 (01351) – Construction Waste Management and as follows:
1. Select lumber sizes to minimize waste; reuse scrap lumber to the greatest extent possible. Clearly separate scrap lumber for use on site as accessory components, including: shims, bracing, and blocking.
2. Do not leave any wood, shavings, sawdust, etc. on the ground or buried in fill. Prevent saw dust and wood shavings from entering the storm drainage system.
3. Do not burn scrap lumber that has been pressure treated.
   a. Do not send lumber treated with pentachlorophenol, CCA, or ACA to co-generation facilities or “waste-to-energy” facilities.

END OF SECTION