Roofing Materials
for
Low Slope Applications

- **Built-up Roofing (BUR)**
- **Modified Bitumen**
- **Single-ply Rubber**

**Built-up (BUR asphaltic) **

System Composite:

- Multiple layers of felts (organic or fiberglass reinforcement) adhered together with hot bitumen, generally 3 to 5 plies.
- Base plies and substrates:
  - Base sheet mechanically attached over nailable structural substrates such as, lightweight concretes and wood.
  - Base sheet adhered directly to primed and prepared reinforced, poured in place or pre-fabricated structural concrete.
  - Rigid insulation installed over fluted steel substrates.
- Surfacing:
  - Aggregated set in hot asphalt.
  - Flood coat of hot bitumen.
  - Aluminum roof coating.
  - Emulsion.

Advantages:

- Relatively lower up-front cost.
- Compatible with most existing structures, flexible applications.
- Multiple plies create a good redundancy factor.
- Maintenance relatively simple on smooth surfaced systems.
- Some manufacturer's system warranties available.

Disadvantages:

- Relatively short life cycle.
- Requires maintenance by experienced roofers. Resurfacing within (5) years on smooth surfaced systems typically necessary.
- Aggregated systems very difficult to maintain properly.
- Application of hot asphalt relatively dangerous compared to other systems.
- Hot asphalt creates unpleasant fumes.

- **Can be very messy.**
- **Susceptible to damage from ultraviolet radiation and ponding water. Roofs must have positive slope.**

**Modified Bitumen (SBS and APP) **

System Composite:

- **Modified sheet is composite of bitumen transformed or modified with rubbers (SBS) or plastics (APP) bonded with polyester and fiberglass scrim reinforcements.**
- **Multiple layers bonded together with hot bitumen (SBS) or heat welded (APP). Generally 2 plies for typical system to 5 plies for a hybrid system.**
- **Base plies and substrates:**
  - **Base sheet mechanically attached over nailable structural substrates such as, lightweight concretes and wood.**
  - **Base sheet adhered directly to primed and prepared reinforced, poured in place or pre-fabricated structural concrete.**
  - **APP can be heat welded directly to primed and prepared reinforced, poured in place or pre-fabricated structural concrete.**
  - **Rigid insulation installed over fluted steel substrates.**
- **Surfacing:**
  - **Aggregated set in hot asphalt.**
  - **Aluminum roof coating.**
  - **Granule surfaced membrane sheet.**

Advantages:

- **Very durable and very strong. Nearly tear resistant.**
- **Relatively light weight compared to some BUR systems.**
- **Generally less labor than BUR systems.**
- **Compatible with most existing structures, variable of applications.**
- **Multiple plies create a good redundancy factor.**
- **Can be installed with modified bitumen adhesives.**
- **Maintenance relatively simple and easy to identify on smooth, coated and granulated systems.**
- **Manufacturer's system warranties available up to 20 years.**

Disadvantages:

- Aggregated systems very difficult to maintain properly.
- Application of hot asphalt relatively dangerous compared to other systems.
- APP heat welded systems applied with open flamed propane torches are dangerous and must be applied by experience roofers.
- Hot asphalt in SBS systems creates unpleasant fumes.

Single-Ply Systems

System Composite:

- One single layer of membrane mechanically attached, adhered or ballasted to an approved insulated substrate.
  - EPDM, most common with adhered, non-welded seams.
  - PVC, welded seams.
  - CPE, welded seams.
  - CSPE, welded seams.
  - TPO, welded seams.

Advantages EPDM (most common):

- EPDM Very flexible. Will stretch 300% to 500% and therefore good for wide open large areas.
- Large sheets up to 100 ft. x 40 ft. and therefore less seams.
- Less labor to install.
- Very light weight.
- Impervious to ponding water.
- Impervious to ultraviolet radiation.
- Relatively safe to install with no hot bitumen or open flames.
- Relatively easy to maintain (except for ballasted systems).
- Manufacturer's system warranties available up to 30 years.

Disadvantages:

- Punctures easily.
- Single-ply means no redundancy factor.
- Susceptible to chemical or petroleum damage.
- Sometimes difficult to retro-fit to existing structures because of incompatibility with existing materials and conditions.
- Ballasted systems very difficult to maintain.
- Mechanically attached systems prone to wind damage.