CLAIMS

1. A treatment facility comprising:

a vault, having walls, ceiling, and a foundation; and

within the vault, a material conveying system configured to convey biomass under an electron beam, wherein each of the walls comprises a plurality of discrete concrete units.

2. The facility as in claim 1, wherein the ceiling comprises a plurality of discrete units.

3. The facility as in claim 1, wherein the foundation comprises a concrete slab.

4. The facility as in claim 1, wherein the vault is re-configurable.

5. The facility as in claim 1, further comprising an electron irradiation device supported by the ceiling of the vault and disposed to irradiate biomass conveyed by the conveying system.

6. The facility as in claim 5, wherein the irradiation device weighs between about 5 and about 20 tons.

7. The facility as in claim 1, wherein each concrete unit has a volume of between about 6 ft^3 (0.170 m^3) and 200 ft^3 (5.66 m^3).

8. The facility as in claim 1, wherein the walls comprise interlocking concrete blocks.

9. The facility as in claim 1, wherein the concrete is selected from the group consisting of regular concrete, high density concrete, pre-tensioned concrete, lead containing concrete, rebar containing concrete and combinations thereof.

10. The facility as in claim 1, wherein the ceiling comprises a plurality of discrete concrete units.

11. The facility as in claim 10, wherein the concrete is selected from the group consisting of regular concrete, high density concrete, pre-tensioned concrete, lead containing concrete, rebar containing concrete and combinations thereof.

12. The facility as in claim 1, wherein the walls, ceiling and foundation are at least about 4 feet (1.22 m) thick.

13. The facility as in claim 1, wherein the vault further comprises a substantially radiation opaque door.

14. The facility as in claim 1, further comprising an opening for continuously supplying biomass into the vault and to the conveying system, and openings for a continuous loop conveyor for continuously removing biomass from the conveying system and out of the vault.

15. The facility as in claim 14, wherein the conveying system comprises a vibratory conveyor.

16. The facility as in claim 1, wherein the conveying system comprises a first conveyor and a second conveyor, which the first conveyor is generally perpendicular to the second conveyor.

17. The facility as in claim 16, wherein the first conveyor comprises a cross-cut outlet for depositing biomass onto the second conveyor.

18. A method of treating a biomass material, the method comprising;

irradiating a lignocellulosic biomass with an electron beam, in a vault having a foundation, walls and a ceiling,

wherein each of the walls comprise a plurality of discrete concrete units.

19. The method of claim 18, wherein the ceiling comprises a plurality of discrete units.

20. The method of claim 18, wherein the walls comprise interlocking concrete blocks.

21. The method of claim 18, wherein the walls, ceiling and foundation include concrete and the concrete is selected from the group consisting of regular concrete, high density concrete, pre-tensioned concrete, lead containing concrete, rebar containing concrete and combinations thereof.

22. The method of claim 18, wherein the vault is re-configurable, and

the method comprises re-configuring the vault after irradiating the biomass and irradiating a second biomass in the re-configured vault.

23. The method of claim 18, wherein the lignocellulosic material is in the form of a lumber product.

24. The method of claim 18, wherein the lignocellulosic material is selected from the group consisting of wood, particle board, sawdust, agricultural waste, sewage, silage, grasses, rice hulls, bagasse, cotton, jute, hemp, flax, bamboo, sisal, abaca, straw, com cobs, com stover, switchgrass, alfalfa, hay, coconut hair, seaweed, algae and mixtures thereof.

25. The method of claim 18, wherein irradiating the lignocellulosic biomass comprises irradiating the biomass on a conveyor.

26. The method of claim 25, wherein the conveyor comprises a vibratory conveyor.

CLAIMS

1. A treatment facility, the facility comprising:

a vault, having walls, ceiling, and a foundation; and

within the vault, a material conveying system configured to convey biomass under an electron beam.

2. The facility as in claim 1, wherein each of the walls comprise a plurality of discrete units.

3. The facility as in claims 1 or 2, wherein the ceiling comprises a plurality of discrete units.

4. The facility as in any one of the previous claims, wherein the vault is re-configurable.

5. The facility as in any one of the previous claims further comprising an electron irradiation device supported by the ceiling of the vault and disposed to irradiate biomass conveyed by the conveying system.

6. The facility as in claim 5, wherein the irradiation device weighs at least 5 Tons.

7. The facility as in claim 5, wherein the irradiation device weighs at least 10 tons.

8. The facility as in claim 5, wherein the irradiation device weighs between about 5 and about 20 tons.

9. The facility as in any one of the previous claims, wherein the foundation comprises a concrete slab.

10. The facility as in any one of the previous claims, wherein the walls comprise interlocking blocks.

11. The facility as in any one of the previous claims, wherein the walls support a network of I-beams and the network of I-beams supports ceiling panels.

12. The facility as in any of the previous claims, wherein the walls, ceiling and foundation are at least about 4 feet thick.

13. The facility as in any of the previous claims, wherein the walls, ceiling and foundation are at least about 5 feet thick

14. The facility as in any of the previous claims, wherein the walls, ceiling and foundation are between about 5 and about 10 feet thick.

15. The facility as in any one of the previous claims, wherein the walls, ceiling and foundation include concrete and the concrete is selected from the group consisting of regular concrete, high density concrete, pre-tensioned concrete, lead containing concrete, rebar containing concrete and combinations thereof.

16. The facility as in any one of the previous claims, wherein the vault further comprises a substantially radiation opaque door.

17. The facility as in claim 16, wherein the door comprises a steel interior in contact with a front and back layer comprising lead.

18. The facility as in any one of the above claims, further comprising an opening for continuously supplying biomass into the vault and to the conveyor, and openings for a continuous loop conveyor for continuously removing biomass from the conveyor and out of the vault.

19. A method of treating a biomass material, the method comprising;

irradiating a lignocellulosic biomass with an electron beam, in a vault having a foundation, walls and a ceiling,

wherein each of the walls comprise a plurality of discrete units.

20. The method of claim 19, wherein the ceiling comprises a plurality of discrete units.

21. The method of claim 20, wherein the walls support a network of I-beams and the network of I-beams supports the ceiling.

22. The method of any one of claims 19 through 21, wherein the walls comprise interlocking blocks.

23. The method of any one of claims 19 through 22 wherein the walls, ceiling and foundation include concrete and the concrete is selected from the group consisting of regular concrete, high density concrete, pre-tensioned concrete, lead containing concrete, rebar containing concrete and combinations thereof.

24. The method of any one of claims 19 through 23 wherein the vault is re-configurable, and

the method comprises re-configuring the vault after irradiating the biomass and irradiating a second biomass in the re-configured vault.

25. The method of any one of claims 19 through 24, wherein the lignocellulosic material is in the form of wood or laminate.

26. The method of any one of claims 19 through 24, wherein the lignocellulosic material is selected from the group consisting of wood, particle board, sawdust, agricultural waste, sewage, silage, grasses, rice hulls, bagasse, cotton, jute, hemp, flax, bamboo, sisal, abaca, straw, corn cobs, corn stover, switchgrass, alfalfa, hay, coconut hair, seaweed, algae and mixtures thereof.

27. The method of any one of claims 19 through 26, wherein the conveyor comprises vibratory conveyor.