CLAIMS

What is claimed is:

1. A method of satisfying the load of a conditioned space, comprising:

conveying primary air from a central air handling unit to the primary air inlet of a chilled beam;

conveying conditioned return air to the primary air inlet of the chilled beam.

2. The method of claim 1, wherein the conveying conditioned return air includes cooling return air from the conditioned space and mixing the result with the primary air from the central air handling unit to produce a combined primary air stream, which is provided to the primary air inlet of the chilled beam.

3. The method of claim 1, wherein the conveying conditioned return air includes cooling return air from the conditioned space and mixing the result in a terminal unit with the primary air from the central air handling unit to produce a combined primary air stream, which is provided to the primary air inlet of the chilled beam.

4. The method of claim 1, wherein the conveying primary air from a central air handling unit includes conveying primary air at a quality and rate that is sufficient to satisfy a ventilation load of the conditioned space but insufficient to supply a design thermal load requirement.

5. A chilled beam system for a conditioned space, comprising:

chilled beam units, each having at least one heat exchanger and configured to receive primary air, eject the primary air through at least one jet to induce a flow of

secondary air through the at least one heat exchanger, the heat exchanger being configured to receive a liquid heat transfer fluid from a heating or cooling source;

an handling unit configured to convey primary air from a central air handling unit to the primary air inlet of a chilled beam;

a terminal unit configured to convey conditioned return air to the primary air inlet of the chilled beam.

6. The system of claim 5, wherein the conditioned return air includes a mechanism for cooling return air from the conditioned space and mixing the result with the primary air from the central air handling unit to produce a combined primary air stream, which is provided to the primary air inlet of the chilled beam.

7. The system of claim 5, wherein the conditioned return air is cooled by the terminal unit and the result is mixed in the terminal unit with the primary air from the central air handling unit to produce a combined primary air stream, which the terminal unit provides to the primary air inlet of the chilled beam.

8. The system of claim 5, wherein the primary air from the central air handling unit is at a quality and rate that is sufficient to satisfy a ventilation load of the conditioned space but insufficient to supply a design thermal load requirement.

9. A system as in any of claims 5-8 wherein the terminal unit includes a condensing cooling coil configured to reduce the moisture content of the return air.

10. A system as in any of claims 5-8 wherein the terminal unit includes a desiccant component configured to reduce the moisture content of the return air.

11. A system as in any of claims 5-10, wherein each air handling unit serves multiple terminal units and each terminal unit serves a multiple of said chilled beams.

12. The system of claim 11, wherein the terminal units are distributed through one or more structure to place them close to the chilled beam units served by each.

13. A method of satisfying the load of a conditioned space, comprising:

creating a flow of primary air from a central air handling unit, the air handling unit providing fresh air from outside a building plus recirculated air in selectable ratios for form the primary air that is conveyed;

conveying the primary air from the central air handling unit to the inlet of chilled beams;

creating a flow of conditioned recirculated air from terminal units, each connected to receive return air from a conditioned space served by a subset of the chilled beams and change an enthalpy of the return air to create the conditioned recirculated air;

wherein the primary air is received by the chilled beams after being combined with recirculated air flow created by the terminal units, the primary and recirculated air being combined within the terminal unit or by mixing output flows of the terminal units and the central air handling unit.

14. The method of claim 13, wherein the conveying conditioned return air includes cooling return air from the conditioned space within the terminal unit and mixing the result with the primary air from the central air handling unit to produce a

combined primary air stream, which is provided to the primary air inlet of the chilled beam.

15. The method of claim 13, wherein the enthalpy change in the terminal units includes removing moisture from the return air.

16. A method of conditioning the air of an occupied space, comprising:

providing a terminal unit with a heat exchanger, the terminal unit being connected to a conditioned space to receive return air therefrom, to condition the return air using the heat exchanger, and combine conditioned return air with a primary air stream, which includes fresh air;

generating a heating mode signal;

configuring one of the terminal unit and a chilled beam in response to the heating mode signal, the configuring including changing an aspect ratio of a discharge into the occupied space or switching the flow into the occupied space from a first aspect ratio discharge to a second aspect ratio discharge, wherein the first and second aspect ratios differ in magnitude.

17. The method of claim 16, further comprising configuring the one of the terminal unit and a chilled beam in response to a cooling mode signal, the configuring including changing an aspect ratio of a discharge into the occupied space or switching the flow into the occupied space from the second aspect ratio discharge to the first aspect ratio discharge, wherein the first and second aspect ratios differ in magnitude.

18. Apparatus for conditioning the air of an occupied space, comprising:

a terminal unit with a heat exchanger, the terminal unit being connected to a conditioned space to receive return air therefrom, to condition the return air using the heat exchanger, and combine conditioned return air with a primary air stream, which includes fresh air,

a chilled beam;

a controller configured to generate a heating mode signal;

at least one actuator adapted to reconfigure one of the terminal unit, a chilled beam, or a further device in response to the heating mode signal, the configuring including changing an aspect ratio of a discharge into the occupied space or switching the flow into the occupied space from a first aspect ratio discharge to a second aspect ratio discharge, wherein the first and second aspect ratios differ in magnitude.

19. The apparatus of claim 18, wherein the terminal unit includes a damper configured to vary a mix of return air from the occupied space and air from the primary air stream.

20. The apparatus of claim 18 or 19, wherein the terminal unit includes an air mover.

21. The apparatus of claim 18, 19, or 20, wherein the terminal unit is connected to multiple chilled beams.

22. A configurable chilled beam, comprising:

a longitudinal primary air plenum, a longitudinal mixing chamber adjacent the primary air plenum;

the primary air plenum having jet outlets opening to the longitudinal mixing chamber, at least some of the jet outlets formed at least in part by at least one movable member;

the movable member being configured such that when moved, a larger opening in communication with the primary air plenum is defined, the larger opening being larger in at least one dimension.

23. The chilled beam of claim 22, further comprising a heat exchanger.

24. The chilled beam of claims 22 or 23 wherein the at least one movable member includes a fluted damper blade.

25. The chilled beam of claims 22, 23, or 24, wherein the larger opening faces the heat exchanger.

26. The chilled beam of claims 22, 23, 24, or 25, further comprising a an actuator configured to move the at least one movable member and a controller configured control the actuator to move the movable member in response to a signal to change between a heating mode and a cooling mode.

27. A configurable chilled beam, comprising:

a longitudinal primary air plenum, a longitudinal mixing chamber adjacent the primary air plenum;

the primary air plenum having jet outlets opening to the longitudinal mixing chamber;

at least one movable member configured such that when moved, a larger opening or at least one additional opening in communication with the primary air plenum is defined.

28. The chilled beam of claim 22, further comprising a heat exchanger.

29. The chilled beam of claims 22 or 23 wherein the at least one movable member includes damper blade and the at least one additional opening includes a mixing register.

CLAIMS

What is claimed is:

1. A chilled beam system for a conditioned space, comprising:

chilled beam units, each having at least one heat exchanger and configured to receive primary air, eject the primary air through at least one jet to induce a flow of secondary air through the at least one heat exchanger, the heat exchanger being configured to receive a liquid heat transfer fluid from a heating or cooling source;

an handling unit configured to convey primary air from a central air handling unit to the primary air inlet of a chilled beam;

a terminal unit configured to convey conditioned return air to the primary air inlet of the chilled beam;

wherein the terminal unit includes a desiccant component configured to reduce the moisture content of the return air.

2. A chilled beam system for a conditioned space, comprising:

chilled beam units, each having at least one heat exchanger and configured to receive primary air, eject the primary air through at least one jet to induce a flow of secondary air through the at least one heat exchanger, the heat exchanger being configured to receive a liquid heat transfer fluid from a heating or cooling source;

an handling unit configured to convey primary air from a central air handling unit to the primary air inlet of a chilled beam;

a terminal unit configured to convey conditioned return air to the primary air inlet of the chilled beam;

wherein each air handling unit serves multiple terminal units and each terminal unit serves a multiple of said chilled beams;

and wherein the terminal units are distributed through one or more structure to place them close to the chilled beam units served by each.