1121-57-135 **Shawn Xingshan Cui*** (cuixsh@gmail.com), 382 Via Pueblo Mall, Varian Laboratory of Physics, Stanford, CA 94305-4060. *Higher Categories and Topological Quantum Field Theories.*

We give a construction of Turaev-Viro type (3+1)-dimensional Topological Quantum Field Theory out of a G-crossed braided spherical fusion category for G a finite group. The resulting invariant of 4-manifolds generalizes several known invariants in literature such as the Crane-Yetter invariant and Yetter's invariant from homotopy 2-types. Some concrete examples will be provided to show the calculations. If the category is concentrated only at the sector indexed by the trivial group element, a co-cycle in $H^4(G, U(1))$ can be introduced to produce another invariant, which reduces to the twisted Dijkgraaf-Witten theory in a special case. It can be shown that with a G-crossed braided spherical fusion category, one can construct a monoidal 2-category with certain extra structure, but these structures do not satisfy all the axioms of a spherical 2-category given by M. Mackaay. Although not proven, it is believed that our invariant is strictly different from other known invariants. It remains to see if the invariant has the power to detect any smooth structures. (Received July 16, 2016)